

Singing Valley



THE STORY OF CORN

by Dorothy Gil

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by DOROTHY GILES

Singing Valleys is American history in terms of the role played by corn. It is a pageant of struggle and achievement, feuds and reconciliations, facts and legend. The story of corn is the story of the birth, the growth and the constant regeneration of a nation.

Throughout the pattern of the history of the entire American continent the motif of the humble cornstalk can be traced. The Aztec and Mayan civilizations were based on corn, and even today the sacred Mayan rite of planting four kernels to each mound is still observed by farmers. Corn saved the first settlers in America, opened the wilderness to wave after wave of migration and gave life and sustenance to the pioneers and their descendants. Corn seed was easily transported, quickly cultivated and readily adapted to many varieties of soil. It flourished everywhere and its fruit became not only one of the basic nutriments of the nation, but also a vital factor in our folklore, history and culture. Corn is to this day the chief product of every state in the union.

Singing Valleys is a source of information and excitement, action and humor, science and anecdote.

A RANDOM HOUSE BOOK

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Singing Valleys

THE STORY OF CORN

“ . . . the valleys also are covered
over with corn; they shout for joy,
they also sing.”

PSALM 65:13

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by Dorothy Giles



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To my mother

IDA WEBB GILES

*and to all others who, like her, preserve
the tradition received from their fore-
fathers who cleared the fields, broke the
ground and sowed with the first corn
the seeds of American liberty.*

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“*First the blade . . .*”

IN APRIL, under the spring rains, the passive cornfields lie on the countryside in sodden brown patches. Ribbons of darker brown—roads, rutted by the frost and by wagon wheels—bind them to the scattered farmhouses and barns. The sky drops down until it seems to smother the earth. All the bright, song-filled space, the home of the bee, the meadow lark and the hawk, is filled with drifting mist.

At this season the country is lonelier than at any other time of the year.

The towns feel this. They draw away from the farmlands and huddle about the white-spired churches. The houses press shoulder to shoulder, turning their backs on the pitiful stretches of naked, wet earth, as men turn their eyes from sight of a drowned man.

But late in April a day comes when the low-hanging mists lift and draw together into a black ball. There is a roll of thunder, followed by a vicious downpour of rain. It rains harder then than on any day since the break-up of winter. Dusk draws in, night falls; the downpour goes on. The long fingers of the rain beat on the tin and shingled roofs. They flatten the cornlands to a muddy brown sea.

Sometime between midnight and dawn the rain stops, and it is very still. The stillness wakes the men who have been waiting for this to happen. They stumble out of bed and pull aside the curtains and peer out at the flooded world. In the east a pale sun is struggling through the clouds. It strikes across the slimy fields. A crow, hunched on the ridge-pole of a barn, flies down the shaft of light and pecks at a lump of wet earth.

That day the sun shines all the day, and a warm mist rises from the fields. This is not like the mists the clouds dropped; it smells different. The men stand at the barn doors and sniff it knowingly, then they turn and take down the plowshares from where they have hung all winter. They rub the blades; they work with oil cans and pots of axle grease. They lift the hoods of tractors and examine cylinders and carburetors.

May comes, and an army rides out into the fields. Every country lane jingles with its passing. Bright blades rip wide the patient earth . . . the harrows comb it. . . . In Maine, in Oregon, in Michigan, the petals of a million blossoming apple trees drift across the new-plowed fields. On the crest of a rounded hill a man, with a sack of corn slung across his chest, moves rhythmically, with out-flung arm, along the raw furrows.

The nights grow warm. By Illinois farmhouses the lilacs smolder into bloom. The wild grape and the scuppernong blossom over tumbled stone walls along the Monongahela and the Mississippi, filling the night with heady fragrance. And in Connecticut, in Kansas, in South Dakota, in Tennessee, farmers meeting at crossroads draw up, cast weather-wise eyes at the sky and greet each other, "Corn-growin' weather."

July. The cornlands are a sea of tossing green. Green ripples where the breeze strikes. Crisp green streamers crackling under the noon suns . . . "Seems like you can fairly hear the corn a-growin'." At sunset men lean on fence rails measuring the strong, upward thrust of the jointed stalks . . . fifteen, eighteen, twenty feet high. Cautiously they begin to count the harvest.

Every day now the sun grows hotter and hotter. The soil dries and powders. The sharp green of the corn leaves fades. The leaves droop and hang listlessly against the stalks. Over in the west clouds pile up. There is a roll of distant thunder, and across the sultry horizon a warning yellow streak—"cyclone." In the hearts of men, women, children, fear is born. "If it hits the corn!"

August. The dog-star blazes in the southern sky. The corn stands still. The sea of green breaks into a froth of pale tassels and every thread of these is fringed with gold. Here is dust richer than any Klondike yield; the wealth of Montezuma; the treasure of the Gran Quivira which lured Coronado across a thousand miles of desert. He saw the green maize fields of Kansas and never knew that his eyes beheld a wealth beyond Spain's greediest dreams.

Now the silk-veiled, nubile ears lean out from the towering stalks, at once eager and shy, waiting for the bridegroom's coming. Down from the proud tassels floats the pollen.

Under the cloudless August skies, under the still, hot moons, through dusk and dawn, priested by the evening and the morning stars, the great marriage is made. For this the earth was torn by plowshares and harrows; for this men bent the knee and plodded after beasts through smoking furrows. For this, frost, thaw, wind, rain, cloud, sun and a numberless host of insects have worked together. Eternal male, eternal female; forever seeking, finding, giving, receiving. . . .

"After that, the full corn in the ear." Within the close-sheathed green wombs the kernels form and swell. Deeper into the earth drive the roots, urged on by the needs of the new life which is to come. A hush falls over the world; the hush that precedes birth. The corn gathers to herself all her strength. Her time is close, now.

September. The harvest moon rides into the eastern sky and a billion, billion wombs deliver life. Out from the spent cornfields it pours on the backs of men and beasts, in carts, in trucks, in barrows. It fills the barns. It runs in a golden stream along the highways to the towns. It brims the holds of ships and barges. It pours over the sides of laden freight cars. All these bear it away to the hungry mills.

The harvest moon wanes; the Moon of Hunters takes the sky. Frost sears the fields and sets the maples aflame. Bittersweet blazes where the scuppernong lured the June bees. In

and out between the girdled stocks the pumpkins lie like fallen suns. The sun withdraws into his house of the south. The darts of the wild geese pierce the sky, flying after him. They dare not stop to glean, for the snow is on their tails—a scud of white flakes across the Black Hills. Then comes the wind, echoing the long-drawn hoot of the great Arctic owl.

The cornfields shudder and lie still. Over the face of them a white sheet is drawn. Once more the ancient doubt uncoils in the minds of men, “Is this the end?”

“Thou fool, that which thou sowest is not quickened unless it die.” Persephone must first descend into hell before she can bring again the crocus and the shadblow flower.

Already death is swallowed up in victory. Even while the blizzards howl, the tall silos stand guard beside the barns. Within them the cut green corn steams and steeps, giving forth its rich juices for the beasts in the stalls. In the mills the turbines turn hour after hour, day after day. The meal flows out in a golden stream, and every grain of it is life. Men, seated at desks in distant cities, men whose eyes have never rested on the green cornlands, turn the harvest into figures and gamble with them. Chemists in quiet laboratories sift the golden grains through their retorts and read there a future the sower never dreamed of. To factory workers it is employment, to bankers it is dollars, to politicians it is votes, to the war-makers it is men, guns, victory.

For corn is bread and ham and eggs and milk and cream and cheese. Corn is sugar and starch. Corn is clothing for men’s bodies and shelter above their heads. Corn is oil and wine.

Corn is life.

Its life is the life of men. Sown in weakness, it is raised in power. It dies, yet it lives. It is eaten; and lo! of it there springs a greater life. It is Isis. It is Demeter. It is that Queen of Heaven to whom the women of the Hebrews offered little cakes of their baking. It is the eternal Mother, at once beneficent and terrible, on whose fecundity man must depend for his existence, but of which he is forever deeply afraid.

To us, in America, it is the strength of our past, the power of our present, the security of our future. For corn is the symbol of American democracy. And the story of corn is the story of the American people.



I

Early Corn Planters

CORN, in the language of Shakespeare, Milton and the translators of the King James Bible, means loosely, any sort of edible grain. It conveys no exact meaning that a botanist can analyze. To the primitive Saxons who devised the word, and took it with them from the shores of the Baltic to England, it probably stood for wild barley, or for the split wheat which was the "corn" for which Israel sent his sons to Egypt. Split wheat and barley were the grains known to the early Europeans.

Language knows no accidents. It was not by slip of tongue that "corn" became the common English name for the yellow kernels which the Spaniards had called for a century by the Haitian name *mahiz*. To those gentlemen of Devon who sailed with Sir Richard Grenville to the Plantations in Virginia, to Drake's seamen, ready to mutiny on account of moldy bread and maggoty beef, the green maize fields that spread around every Indian village in the New World meant salvation from scurvy and famine, renewed bodily strength, and renewed faith in the emprise which had brought them across the Atlantic. All this they expressed when they called the maize by that satisfying round monosyllable which had represented bread and life to their Saxon forebears: *Korn*.

Long before the first white men came to the Americas, maize was known to and grown by all the Indian tribes between the St. Lawrence and Lake Titicaca. Each tribe had its own name for it. Though phonetically different, all these names carried one significance. Whether spoken by Inca, Aztec, Creek, Sioux, Crow, Mohawk, Iroquois or Algonquin, the name for

the maize meant "She Who Sustains Us," "Our Mother," "Our Life."

The first European to make mention of the grain was Columbus. In his Journal under date of November 5, 1492, while at Cuba, he records: "There was a great deal of tilled land sowed with a sort of beans and a sort of grain they call 'Mahiz,' which was well tasted baked or dried, and made into flour."

When the Admiral returned to Palos from that first venture, the *reyes catolicos*, having driven the Moors from Andalusia, were holding court in Barcelona. Summoned there, Columbus was received as one who had added to Castile and Aragon a new world. There were triumphal processions, banners, a rain of flowers. The *senoritas* leaned from their balconies to stare at the bronzed seamen, and at the six grinning Caribs, covered for modesty's sake in leathern breeches and vests. Later, in the palace, the sovereigns received the Admiral with honors usually reserved for princes. He was directed to sit in their presence and to recount to them the wonders of the voyage and explain the spoils he had brought home: stuffed tropical birds and small animals, a handful of pearls, some gold trinkets—among these, perhaps, one of the small gold frog-images of the rain-god, which the islanders used to honor for the benefit of their maize fields. There were also bunches of medicinal herbs and spices, and some cobs of yellow *mahiz* which, the Navigator explained, was the principal food of the peoples of the New World.

It is not likely that the maize kernels which Queen Isabella nibbled experimentally excited much comment. Spain wanted gold. And more gold. There were the long wars against the Moors to be paid for. Too, the Hapsburg marriage of the Infanta Juana, with the chance it offered of an empire on the other side of the Pyrenees, needed to be safeguarded. Only gold could do that. Columbus was ordered back to the Indies almost immediately. The directions given him were explicit. He was to find El Dorado and carry it home to Spain. Caribs

and corn were all well enough as the trimmings of adventure, but his business was gold.

Columbus never brought any great wealth into the greedy harbor of Cadiz. That remained for the conquistadores who followed in his wake, and who settled on Mexico and Peru like a swarm of hungry bees. Back and forth they went, from Brazil, from Panama, from Yucatan, from Lima and Cuzco to Lisbon and Cadiz. The road running northward from Cadiz through Estremadura to the cities of Old Castile became known as the Silver Road for the mule trains laden with bullion that passed over it. Not a little of the horde was dropped by the way. Every village church in the province took its toll in silver altars and ceilings and crucifixes and candlesticks—votive offerings from the men of those parishes who had sailed with Pizarro and Cortes.

The silver was mixed with maize.

In the half-century after Columbus opened the sea-track to the West, Europe had discovered a new source of wealth in foodstuffs and spices. The Portuguese stumbled on it first when they wrested the power in the Orient from the Arabs and sent that first fleet of three caravels, under Serrano, on a friendly visit to the Moluccas. The ships came back with "as heavy a load of nutmegs and cloves as it was safe to carry."

There was money in peppercorns, money in ginger. Sugar could be as profitable as pearls. Portuguese and Spanish sea captains, sailing on voyages of discovery financed out of the national treasury or by some merchant company, were instructed to keep an eye out for foreign spices or foods which might prove profitable in the European markets.

Accordingly the silver ships sailing from the Indies for Spain carried maize. Some of it fed the crews on the homeward voyage. Some of it trickled up the Silver Road. Landowners in Estremadura tried planting it—without success. The soil was too arid, the rainfall insufficient. But over the mountains toward the coast the grain flourished. Maize is still a staple farm crop in the Minho Province of Portugal, and along the

historic Pilgrims' Way to the shrine of St. James at Compostella in Spanish Galicia stand old corncribs of lichen-stone built to receive the maize harvests of three centuries ago.

For a century and more after Columbus's first recorded mention of maize, the grain was brought to Europe in a dozen different ways, and through a dozen different ports.

Dominican friars, returning from the missions in Yucatan to report in Salamanca and in Rome, brought handfuls of yellow kernels to show what food nourished the obstinate heathen. Dutch merchantmen, who had captured Portugal's commercial empire in the East, sailed westward in search of wider trade. They put in at the islands, where they bartered beads and mirrors for sacks of maize. These, carried to the trading posts on the Delaware and the Hudson, became money with which to buy beaver. English slave traders, like Sebastian Cabot, purchased cargoes of human flesh in the Congo for maize grown on the plantations where the wretched blacks were to labor under the overseers' whips. John Leo, who visited Africa in 1535, tells of a tribe living two hundred miles inland, on the Niger, who had "a great store of a round and white kind of pulse, the like whereof I never saw in Europe." The native name for it was *manputo* (Portuguese grain). Leo explains in a footnote: "This is called maiz in the West Indies." Barbary pirates, preying on the treasure ships coming heavily laden from Mexico and Peru, seized the grain in their holds only a little less greedily than they snatched the bars of bullion. The Turks scattered maize across northern Africa. They carried it to Constantinople and up the Danube into the present-day Roumania and Hungary, then part of the Ottoman Empire. The Balkan peasants grow maize today as their Turkish masters taught them to do. And at harvest the husking ears are hung from the house eaves to dry in the sun, exactly as the Iroquois hung them from the front of their Long House; as the Aztecs hung them from their terraced pueblos; as the Maya hung them in Chichen Itza and in

Palenque and in Copán two, perhaps three, thousand years ago.

In the course of these European wanderings the grain was called by a variety of names: Guinney wheat, Indian barley, Turkie wheat (Everything strange and seemingly crude was accredited to the Turks, it seemed—even the national fowl of Yucatan), and wherever Spanish was spoken, mahiz.

Tobacco, potatoes, corn—these three the Americas have added to the world's store. All three have made political history. Sea captains and merchants took to smoking long-stemmed pipes of the fragrant weed, and out of the smoke rings they puffed the fetters of the African slave trade were forged. Sir Walter Raleigh planted in his kitchen garden at Youghal a bushel of the queer brown tubers brought to him from Peru. Three months later he and his friends sat down to dine off a platter of the food which was to nourish Sinn Fein. The Spaniards who followed Pizarro and Coronado, the Frenchmen who sailed with Champlain, Raleigh's Virginians, Brewster's Puritans, Penn's Quakers, the Swedes on the Delaware, the Dutch on the Hudson, all found in the red man's maize a food which sustained them while they conquered those who gave it them to eat. They rose up refreshed, and built the cities of the new world on the cornfields.

So the grain which had been called "Our Life," "Our Mother," "She Who Sustains Us" kept faith with its name.

The part the maize had played in the founding of the American colonies was well known to historians by the middle of the eighteenth century when Linnaeus published his *Species Plantarum*. Linnaeus had at his command numerous old herbals like Gerarde's which contains a drawing of "Turkie Wheat" scarcely to be distinguished from illustrations of American corn in seedsmen's catalogues today. He had, too, specimens and letters from botanists all over the world, including his pupil Peter Kalm whom he had sent on a tour of the American colonies.

Linnaeus turned the maize kernels in his thin scholar's

fingers. He was a man of cities, whose life had been lived within university walls. Gazing over them he had glimpsed snow peaks, blue fjords and the neat barley fields of the Scandinavian peasants. Only from books and travelers' tales did he know of the land of the Plumed Serpent, where the mulberry and banana trees spread over crumbling cities whose very names were lost. The Franciscan Provincial and Bishop, de Landa, had told of them, in his *Apologia* after he had been reprimanded for his cruelty to the Indians of Yucatan. His book, with its amazingly detailed picture of the life of the Indians of that part of the world, was circulated widely in Europe. De Landa revealed on every page the importance of the maize to the Indians of Central America. He credited the maize, as their chief food, with the fecundity of the Indian women. "They are excellent nurses first because from the maize they take away the milk and thicken it at the fire making a sort of curd for morning use and this they drink hot. This produces plenty of milk. And again because their constant grinding of the maize without tying up the breasts causes them to grow large and thus hold a great deal of milk. . . ." He described the planting and harvest festivals of the maize fields; how a man's wealth was in his granary and *milpas* (cornfield); how these savages, too ignorant to know about money, used maize for barter because it was the one thing of which every man stood in need and of which a man could not have too much. Bitterly he told how he had tried to stop the Indians' worship of the Earth Mother and her son, the "Young Green God," which was a deification of the maize plant.

Other priest-chroniclers of the Mexican and Peruvian conquests had added their evidence to de Landa's complaint. No matter how these doughty Christians had preached, threatened, punished, burnt at the stake, the Indians continued to pay homage to Cinteotl, the maize-god, and to the fecund and terrible Coatlicue, Mother Earth. Even those Indians who obligingly accepted the Christian God and the saints still kept

up their devotions to Coatlicue and Cinteotl, protesting that if they forgot these older divinities there might be no harvest.

With all these tales in mind, Linnaeus sought for a Greek word which would tell the story. He found *zea*, which means "the cause of life." His pen wrote it down. It was one way of saying what the various Indian names for the maize implied. *Zea mays*. That said it. That linked the old world and the new. It gave the new world's grain the dignity of classic tradition; and it also kept the memory of a race of copper-colored men who built, out of the maize, a civilization which antedated that of Western Europe.

Zea mays . . . it might even be translated, "That which caused the Maya to live."

"The destiny of nations," said Brillat-Savarin, "depends on the way they nourish themselves."

The history of the peoples of the three Americas is the story of a civilization which was cornfed from its beginnings.

Let us look at those beginnings.

Of all the lost peoples of antiquity none so stirs the imagination as do the Maya. Remnants of their amazing civilization lie in the tangled jungles of Guatemala and in the thorny scrub of Yucatan. What more may lie below the waters of the Caribbean and the Pacific is surmise. Under the jungle floor of Guatemala are to be found traces of ancient roads which come up out of one sea, cross the isthmus, to be lost again under the further waters. The isthmus as it is today is only the serpentine backbone of a country that once was; a skeleton from which the seas have licked away the flesh.

Certainly the story of a prehistoric continent shattered by a series of earthquakes and finally submerged under the sea, the waters of which were turned to mud so that no ship could pass through them, appears too frequently and too widely to be dismissed as pure fantasy. One of the treasures of the British Museum is a roll of parchment painted with hieroglyphics by Mayan scribes, no one knows how many centuries ago. It de-

scribes in vivid detail the cataclysm which "in the year of 6 KAN, on the 11th, Mulac, in the month Zac"—approximately 3,500 years ago—destroyed the Land of Mu and some 64,000,000 of its inhabitants.

Whether the Maya of Guatemala, where the oldest ruins on the isthmus have been uncovered, were survivors of the lost Land of Mu, or whether they arrived on the Pacific shore long after Mu was a legend, matters little here. Survivors or immigrants, they found growing on the highlands above the Gulf of Tehuantepec that from which a new empire was to grow.

What they found were two grasses. Today these parents of the maize have botanical names: *euchlaena mexicana* and *euchlaena luxurians*. The latter is the parent whom the child most resembles. The two are not found together, and native, anywhere else in the world. Therefore, botanists agree that the marriage between them, and the birth of their child, the maize, could only have taken place in this particular section of the western hemisphere.

Here, then, on the west coast of Mexico, in the temperate highlands above the Pacific, our corn was born. And here, with the first corn, the glory, the power and the fabled wisdom of the Maya had their beginning.

Was the cross-fertilization which produced the grain accomplished by accident of wind and insect? Or did man have a hand in it? It may be that some wandering hunter remembered the sweet taste of bread eaten in Mu or in some land west of the Pacific. Perhaps he remembered that that bread had been made of meal ground from millet seeds. Teased by these memories, prompted by the stirrings of genius, he may have experimented with the pollen of the two tasseled grasses which he found growing on the Cordilleras. Intent or accident? At this distance, what does it matter? One man, however ignorantly, served Nature. One man scratched a hole in the red earth, dropped into it a few of the seeds he had mated, and waited for results. One man measured the height

of the first cornstalks—stronger and taller than either of the wild parents; watched the ears break out and fill; felt through the husks the kernels form, waited for these to ripen. One man went up and down the corn rows and gathered the first harvest. One man, using the jawbone of a deer, scraped the dried kernels from the cobs into a basket.

Then, his ingenuity exhausted, he handed the basket to a woman.

Perhaps she, too, drew on some dim, racial memory. She spread the grain on a sloping stone, and with a smaller stone pounded and rolled it to a coarse meal. This she mixed with spring water and shaped between her palms into cakes. She heated stones in the fire and laid the “pones” on them, watching anxiously while the dough formed a crust that browned and smelled surprisingly sweet. Proudly she lifted the first baking from the stone and held it out to the man.

He bit into it. From his expression the woman knew at once that it was good. So did the children. With a whoop they snatched greedily at the other loaves.

Heretofore the man had been a wanderer, serving the stone knife he carried, following the game wherever it led him. Now the knife had a rival. It was no longer his sole source of life and food. For he had corn. Urged by the memory of that sweet taste on his tongue, he burned off a wider patch of forest land, scratched the ground between the charred tree stumps with a forked stick and scattered another, and a larger planting of the seeds. While these were growing, he went into the forest for game. But after every kill he hastened back to the clearing to see how his new crop of bread was coming on. Then it occurred to him to leave the woman there beside the cornfield, to tend it while he was away. She was charged with the duty of keeping off the deer which would have eaten all the green stalks in a single night.

It was strange how the growing of grain changed man's attitude toward the animals of the jungle. Heretofore he had sought the deer, and his enemy had been the jaguar which

preyed on them and cut down the man's food supply. But now the deer menaced the man's corn. The jaguar which hunted them became the friend and protector of the corn. Later, as we shall see, the corn planters recognized this and repaid the jaguar by awarding him a place among their gods.

But in the early days it was the woman who stood guard beside the growing stalks. No doubt she took great credit to herself for the whole matter. Womanlike, she may have appropriated to herself the productive quality in the earth.

The man had no way of knowing it, but when he gave up serving the knife-god and began to scratch the earth and sow, he sowed with the first maize the seeds of a society in which woman was to wield a power she never knew in the old hunting-knife days. Not with an apple, but with bread, woman tempted man and cost him his freedom.

Waiting for the second harvest, was it the man or the woman who felt the first doubt? What if the miracle could not be repeated? Suppose this new planting of grain would not grow and produce ears as the first planting had done? Suppose the earth withheld something that the plants needed? Suppose some dark force came up out of the ground and destroyed them?

There was one obvious reply to these fears. That was to propitiate the First Cause of all things; that which, without form, yet created all forms; that which was the beginning and the end of all. The man and the woman knew dimly that this First Cause existed. But it seemed very big and very far away. Too remote and too impersonal to be concerned for one small patch of green stalks in a world that was covered with forest and jungle.

"After all"—if it was the woman who made the suggestion—"when you put the seeds in the ground, you give them to the earth. She is their mother. She nourishes them so they grow strong, and bring forth seeds of their own. Let us make an offering to the Earth Mother so she will feel pleased. Let us

feed her, where we plant our corn, so she will be strong and bring forth strong plants . . .”

The man agreed that there was wisdom in this. He and the woman thought of ways of pleasing the Earth Mother. They laid offerings of grain and meat on the ground where they planted their corn. They sang songs to it. They danced and made love on it.

But even with all this ritual, which may have pleased the Earth Mother, for the corn grew and yielded a better harvest than the first crop had produced, the man was not entirely satisfied. “The Mother cannot bring forth young by herself,” he reasoned. “She must be quickened by a husband before she can give birth. The husband of the Earth Mother is the Rain. Not the raindrops themselves, but the great body of water in the sky from which the raindrops come.”

And to prove how right he was, he pointed out to the woman how the green grain sprang up after the rainy season, and would not grow at all if planted when the weather was hot and dry. . . . “You see, the Earth Mother does not do it all by herself. She cannot. The great Serpent in the sky that flashes out of the black stormclouds, the one we see sometimes with clouds like feathers about him,* when the trade winds begin to blow, has to do his part. We must include him in our prayers. . . .”

How simple it was! Mother Earth and the Plumed Serpent who sent the quickening showers; and born of them, for the service of man, their son Ghanan, the Young Green God, who was the maize plant. Sometimes this deity was called Yum Kaax, “Lord of the Harvest Fields.” But always he was thought of as youthful and friendly, and closer to human beings than his parents or any of the other deities. In the carvings, Ghanan is the only one of the Mayan gods represented with a human countenance. So far as is known, he himself never demanded of his worshippers any human sacrifices.

As the centuries passed and civilization advanced, the Maya

* The sun when drawing water.

were admixed with other tribes from the north. These brought their divinities with them. The simple trinity which had sufficed the corn-planters was invaded, and gave place to a complex system of theology. According to the Aztecs, the great inheritors of Mayan culture, the Earth Mother Coatlicue was not the mother but the grandmother of the maize-god. It was her son, the bloodthirsty god of war and his wife the witch-goddess and queen of the underworld, called sometimes Heart of the Earth, who became the parents of Cinteotl, which was the Aztec name for Ghanan. Even the sex of the maize-god was gradually lost sight of, so that Cinteotl was frequently spoken of and represented as a goddess. Here again the matriarchy, which tends to develop in every civilization that is founded on agriculture, was at work.

But through all the migrations of the Maya, through the invasions of Nahua tribes out of the north, through the empire of the Toltecs and the amazing civilization which the conquerors of the Toltecs, the Aztecs, set up in Mexico, Coatlicue and the Plumed Serpent (Kukulkan or Quetzalcoatl) continued to hold first place in heaven, the place the corn had given them.

Not only did the corn give the Maya their gods, it turned them from hunters into farmers and villagers. In the strictest sense they cannot be termed an agricultural people. Field agriculture, in which large tracts of land are worked, requires a plow and the aid of domestic animals. In Peru, llamas were occasionally harnessed, and men, too, pulled crude plows through the terraced fields. But throughout the world of the Maya there were no draft animals, and no field tools except wooden rakes and planting sticks, and crude axes with which to clear the brush.

Yet the maize flourished in the river valleys, up the hills and on the tablelands. Like the mercy of God, it belonged to no tribe or class. It yielded its bounty in proportion as the seeker after that bounty labored for the blessing. More industry and intelligence are necessary for the cultivation of every


other cereal. It was not even necessary to clear or turn over the soil for corn. One had only to girdle the trees with a stone hatchet to destroy the foliage and let in the sunshine, scratch the surface of the soil, and drop the kernels into hills. After that the maize took care of itself. To the ignorant savage who knew no more of agriculture than this, the maize yielded him enough to keep him from starvation. The husbandman who had reached a higher degree of intelligence and who irrigated his land and worked the hills with a hoe, gathered the harvest into generous bins.

Ultimately, the corn's lavish rewards in return for very little labor increased the population and the national wealth. It made the Maya builders of cities. In Guatemala, along the Montagua River in Honduras, and later in Yucatan, the corn-planters developed a culture which is one of the world's wonders. Perhaps 2000 years ago these early Americans drained the jungle floor, built temples, paved avenues and developed a communal life. They traded with other tribes living up and down both coasts of the Americas. Europe may not have been unaware of them. The sands of Panama have given up the skeleton of a Roman galley, some bits of rusted armor and coins bearing the inscription of Augustus Caesar. At a time when the ancient Britons were painting their faces blue and dressing in skins, the Maya were setting down their history and religious philosophy in a form of picture writing which, according to von Humboldt, they and the Egyptians must have learned from the same source. They were designing intricate sculptures to cover the façades of great, pyramided temples; they were weaving and building. Their skill in mathematics is revealed by their invention of the abstract conception of zero, which made possible for them intricate astronomical calculations, resulting in a continuous calendar.

On the east and west sides of the plaza of their city of Uaxactun, built somewhere about 591 A.D., the arrangement of temples and pyramids formed a giant sundial which determined the procession of the equinoxes and solstices through

the year. By the shadows on the paved square the priests told the times for planting and for harvest, and for the religious ceremonies which attended these. The calendar of the Maya, which antedated that of the Aztecs by at least five centuries, was evolved by the corn planters to serve them in the maize fields.

Through the first five centuries of the Christian era the Maya flourished in Guatemala and Honduras. Their cities, Palenque, Copán, Quirigua and others were thriving centers. The denseness of the population is evidenced by the fact that Copán and Quirigua are only twenty-five miles apart. To the cities—to market and to attend religious ceremonies in the temples—came the country folk. They came afoot, and in sacks on their backs and in baskets balanced on their heads they brought maize, which was the food of rich and poor alike, and the chief article of trade.

They stopped and stared at the carvings on the temple of Copán where the maize-god climbed over writhing serpents—symbols, as everyone knew, of rain. They halted before the figure of Ghanan, in his leafy headdress, holding in his hand the day-sign  Ik, which meant Life. Bowing reverently, they scattered a few grains of maize before him, and murmured thanks for a plentiful harvest.

What, they asked themselves in their well-fed security, was there to fear so long as the rains came regularly and the corn-fields continued to yield? What could possibly happen to a people who had plenty to eat?



II

Mexican Maize Fields

MUCH was to happen. . . . At the very time that the agricultural Angles and Saxons were landing on the shore of Britain, bringing with them the "korn" (millet or barley) they had grown on the banks of the Elbe, the Maya of Guatemala, builders of Copán, Palenque and a dozen other cities, suddenly forsook the cities they had raised and migrated eastward and northward into the isthmus of Yucatan.

Why they left the seat of their first empire remains a mystery. The ruins of the cities show that they were not destroyed by invaders, but deserted. Those who built them walked away and left them standing there to become the haunt of snakes and lizards. Those who had cleared the *milpas* that stretched away from the cities on every side forsook the fields. The rains brought the jungle closer and closer, until all mark of cultivation was blotted out under lush wild growth.

It was one of those extraordinary migrations which have occurred several times in the history of the Maya. It may have been inspired by some religious belief. Whatever the driving force, it was sufficiently powerful to empty cities which had had a population of thirty thousand, and to send a highly civilized people into a new and unpromising wilderness.

Not all went, of course. Descendants of those who chose to stay on the fields they had cleared, tilled and sown, rather than set forth into the unknown, still live in the mountain villages of Guatemala. They are not a pure race. The Maya strain has been crossed by half a dozen later tribes. But as each wave of invaders was less civilized than those in possession of the land, the newcomers adopted the habits and customs of the older

settlers. So among the natives of present-day Guatemala are preserved folklore and folkways that originated in the far-off days when the tribes came down from the Cordilleras to pay homage to the Plumed Serpent and to the "Young Green God," Ghanan.

Their agricultural customs in particular are derived from ancient Mayan sources. The tribes that invaded the land were not corn-planters. They received the gift of bread from those they conquered. From them, too, they learned to "make *milpas*" by burning off the forest growth, and planting in the ashes seeds of the maize. Even when the Spaniards came, bringing a new law and a new religion, they, too, soon adapted their ways of living to include certain of the native customs. Through all the invasions and conquests the real conqueror was the maize. It, not the laws laid down by the Spanish governor or the Catholic Church, determined the seasons, gave success or failure, poverty or wealth, happiness or sorrow.

With the desertion of the Guatemalan cities in the sixth century A. D., the story of the Maya moves to Yucatan. There the immigrants proceeded to build out of the native limestone new cities that rivaled for size, elegance and culture the capitals of their old empire. For the next five centuries, Chichen Itza, Mayapan and Uxmal were to represent civilization in the West. It, too, was a civilization founded on corn. The wanderers had carried Kukulcan, The Plumed Serpent, and Ghanan with them. They built them temples in the new cities that were more elaborate than the old shrines higher in the hills. In Chichen Itza, in particular, the cult of the rain-god assume an importance that it could only have had in a land whose soil needed plentiful showers to make it produce. Indeed, so urgent was their need of rain that, under Aztec influence, the Maya finally instituted human sacrifices to the deity. In times of drought, a young and beautiful virgin was cast into the sacred well at Chichen Itza as a bride and a bribe for the rain-god. Some years ago, when this well was dredged, the mud gave up not only a treasure of gold disks, turquoise,

masks, knives, bells of copper and gold,* but many pitiful skeletons, the bones of the rain-god's brides.

The rise of great cities in Yucatan necessitated a vigorous farming population round and about the cities, to feed the townsfolk. True, the sea yielded fish, and the forests wild game: "Yucatan" means "the Land of the Turkey and the Deer." But, still, the chief staple of food was the maize. The Maya of Yucatan were still corn-planters. They remained so up to the time of the Spanish conquest.

Ninety-nine percent of what is known of the habits of the Indians of Yucatan is derived from that *Apologia* of Bishop Diego de Landa which was to inspire Linnaeus. De Landa was sent out by the Franciscans to be Provincial of the Order in Yucatan. He was a militant Christian who, if he could not convert, burnt. In July, 1562, he held an auto-da-fé in the town of Mani in which he destroyed, besides recalcitrant parishioners, five thousand idols and twenty-seven Maya manuscript rolls. Nor was his wrath directed only at idols and the books of the pagan priests. His rule was so cruel that even Spain could not stomach it. The Order recalled de Landa, and the Council of the Indies reprimanded him severely. For ten years he remained in Spain where he wrote his book, setting down in detail all that he had learned of the Maya from his time among them, and from what had been told him by two converts, one of them a member of the famous Cocom family, one-time lords of Mayapan.

De Landa's account leaves one in no doubt as to the basis of Indian civilization in Yucatan. The life in the Maya villages was communal. Round about stretched the *ejidos*, the town fields which were owned by the village and divided among the freed men, each married man being allotted approximately four hundred square feet. Here were grown squash, beans, okra, yams, tomatoes and various fruits. Farther away, where the forest had been burned to make room for them, lay the *milpas* (cornfields). Because the maize quickly

* In the Peabody Museum, Boston.

exhausted the nitrogen in the soil, and because the Indians did not know how to fertilize the cornfields, it was necessary to start new *milpas* every third or fourth year, allowing the old ones to lie fallow and renew themselves.


In the idiom of the natives: to live was "to make *milpa*." A woman needed a man to "make *milpa* for her." A prudent man was known by his full granary. He grew twice as much maize as his family could eat. The surplus became money to be bartered in the market for other goods. When one of the villagers made the journey to the city, with his *macapal* (netted bag) slung over his back and held by a band across the forehead, he thought nothing of carrying in it one hundred and fifty pounds of maize. Then when he returned, walking with that pigeon-toed gait and bent head that marks the *macapal* bearers, the villagers would gather about him for news. Always the first question asked was, "What's the price of maize?"

The maize grown by the natives of Yucatan was of four colors—white, red, yellow and blue. A religious significance was attributed to the colors, which were also associated with the four points of the compass and with the Four Bacabs, the gods who held up the corners of the earth and so influenced the winds and the rains. When the Indian went out to sow he carried the seed in a sack slung over his shoulder. With a sharp, pointed stick he made a hole in the ground, dropped into this four, or sometimes five, grains of maize and covered them over.

Four kernels of corn to a hill. The New England farmer still plants his sweet corn that way. The way Squanto taught the men of Plymouth to plant; the way John Smith learned of Powhatan, and instructed the starving gentlemen of Virginia to follow for success with the crop. In the southern states they have a rhyme for the ritual:

One for the squirrel, one for the crow,
One for the cut-worm and one to grow. . . .

In this connection, it is interesting to note that the sign

for the fifth day of the Mayan month of twenty days, was written . It signified planting, and was presided over by the Four Bacabs. The four grains of maize in the hill are easy to read. So to this day in thousands of American gardens, the Mayan planting-gods are honored.

Transcribing from Bishop de Landa's book:

The winter begins with St. Francis' Day (October fourth) and lasts until the end of March. There is sown a certain kind of maize at St. Francis' Day which is harvested early. . . . There is a short hot spell at the end of January lasting into February when there is no rain except at the change of the moon. . . . The rains come from April to September. Then most of the crops are sown and mature. . . . The natives go into the *milpas* and cut the brush in the autumn. . . . This is burned in March and April, at which time they hold ceremonies connected with planting. . . . The sowing is done in the dry ground before the rains. . . . They take little care of the fields after they are sown except to clear away the second growth of brush. . . . The ears are ripe in November. . . . The men go into the fields and bend the stalks downward, pulling the ears of maize down so the birds cannot peck at them. . . . When the ears are harvested they are stored upright and close together in well-constructed granaries. . . .

The Indian women put maize to soak the night before in lime water, and in the morning it is soft and half-cooked. It has lost its husk and nib. Then they grind it on stones and make it into balls for the use of laborers, travelers and sailors. . . . This keeps several months, except for souring. Of this they take a lump, dissolve it in a gourd or vessel and drink the liquor, it being of excellent taste, every morning. . . . From the maize that is more fully ground they take away the milk and thicken it at the fire making a sort of curd for morning use; and this they drink hot. Upon what is left from morning they put water for drinking through the day, since they are not accustomed to drink water alone. . . . They also toast the maize and then grind and mix it with water into a very refreshing drink, putting into it a little Indian pepper, or cacao. . . . Out of maize and ground cacao they make a sort of froth that is very delicious, and with which they celebrate their festivals. . . .

From the cacao they extract a grease much like butter, and this mixed with maize forms another agreeable drink. . . . They prepare many kinds of bread, good and healthful, except it is not good when cold. The Indian women are kept busy making bread twice a day. They have not learned how to make a flour that can be kneaded like wheat flour.

Nor, according to the observing de Landa, did a man's need of maize cease with death. The mouth of the corpse was filled with ground maize moistened with a drink called *koyem*. After these preparations for the next world the body was buried, and with it were placed some small stones, to serve for money on the journey into eternity. The ancient Peruvians also believed that the dead had need of maize. They kept a feast every year, at about the time the Celts kept Hallowe'en, and the Christians observe All Souls' Day, when they dropped maize into the graves of their dead through openings left for that purpose.

Among all peoples who get their living directly from the fields, old customs have a way of lingering. Perhaps, then, it is not surprising to find a modern ethnologist discovering in the course of a year spent in a village of Yucatan many of the same customs de Landa described nearly four hundred years ago.

In the Mayan villages today the activity of every family centers about the hearth, which is made of three stones on which is set the pot, and the griddle for baking *tortillas*. Beside the hearth stands a round wooden table on which the *tortillas* are patted out. Close by is the *metate*-stone with its "hand"—the stone roller with which the maize is ground to meal. Many of the *metates* still in use are very old. Some of them are carved to represent the dragon, symbol of Mother Earth, or the frog which was one symbol of the rain-god.

And still in these homes and in the villages, old ceremonies connected with planting and harvesting, with the burning of


the brush in the *milpas* and the invocation of the rain-god's blessing upon the crops are observed.

True, the Catholic Church has thrown a veil of Christian symbolism around them, but the old gods of the earth and the fields look through the veil. They are very little changed. For example, the pagan Dinner of the Milpa which falls in the month of Pop (July) continues to be the chief holiday of the season, though in these later years it has been renamed "Fiesta of Santa Cruz." At this time three bowls of ground corn are set out in every house before the crucifix. At the same time thirteen roasting ears are laid on the ground outdoors to feed the *Yuntzilob*, protectors of the cornfields.

The priests in the parishes have learned what Bishop de Landa could not learn, that is, the virtue of tolerance. When they see, between the rows of sprouting ears, little clay images of the fertility gods, omphallic and obscene and frequently with rosaries twined about their squat bodies, they look the other way. They know that the old gods never die. They take new names, and new faces, that is all.

The greatness of the Maya covers more than one thousand years. By the end of the first half of this period, when they migrated to Yucatan, they had developed out of the earlier communal life a society and a caste system made possible by an abundance of food produced with small amount of labor. Cheap food meant then, as now, cheap men. The tropical climate made men, as well as the maize, prolific. So there were thousands of hands to cut and carve the stones, to build the cities with their temples and pyramids, their palaces and sculptured walls. There was a serf caste to labor in the cornfields, a numerous priesthood and a leisure class to listen to the tale tellers recount legends of the fabled past of Mayach. Even the Plumed Serpent, Kukulcan, seemed not so far removed from man now that man had progressed to a state that approached the power and wisdom of the gods. With the com-

placency that has moved many races to create God in the image and likeness of man, the Maya appropriated Kukulcan as an ancestor, the founder of the nation, who had promised his children this magnificent destiny.

But through their pride ran an ever-present appreciation of that which was the foundation of their wealth and greatness—the corn. A beautifully carved, but broken, stela found at Yaxchilan depicts a kneeling figure whose reverent face is uplifted toward a pair of hands—universal symbol of the creative power. The hands hold out the sign  KAN. This is the sign for the first day of the Mayan month, and stands for maize.

So clearly the wise men of Maya taught that: “In the beginning was Corn; and from corn came enlightenment, learning, civilization, power. . . .”

It is scarcely to be believed that a people as vigorous as the Maya did not venture out on the sea to discover and trade with other tribes. In later years, when the strength of the nation was nearing exhaustion, they lived in dread of the cannibal blacks of the islands, and built massive sea-walls against their raids. But earlier, the long canoes of the Maya must have threaded the Gulf to the shores of Florida and Mississippi. There is a legend that the Suwannee River gets its name from “Water Beloved of the Sun-God” in the Maya tongue; and that a colony from Yucatan was found in the great Okefenokee Swamp in southeastern Georgia, where large earth mounds have given up remnants of prehistoric civilization.

If up the Suwannee, then why not up the Mississippi? And once they had penetrated this wide waterway, might they not have entered the Ohio and the Missouri? Scattered through the midwest are thousands of earth mounds, once the dwelling places of men who planted maize and ate it, and left the charred cobs with heaps of broken potsherds, arrow heads and stone axes, to mark where once they lived. In Adams County, Ohio, is a gigantic effigy mound of earth built up from the

surface of the ground and about fifteen hundred feet long, in the form of a writhing serpent with an egg in its mouth. Can this be Kukulkan?

There is not one of the ancient mounds or cliff dwellings, whether in the southwest, south or midwest, that has not given up to the archaeologists remnants of maize. There is a wide difference in the size and type of the maize-cobs; many of those from the caves and ruins of Nevada and Arizona are almost dwarf, not more than an inch in diameter and about four inches long, evidences of culture in desert country and with no, or very primitive, system of irrigation. The cobs discovered in Cherokee and Iroquois villages are twice that size. There is little to choose between them and the corn grown by American farmers of fifty years ago.

In the face of these facts, can we dismiss as pure myth the Saga of Eric the Red, "writ by hand by Hank Erlendson" somewhere between 1305 and 1338 telling of the discovery of Vinland, and its "self-sown wheat fields"?

Hank Erlendson proclaimed himself a historian, not a teller of fanciful tales spun out of his own imagination in the long Icelandic winter nights. Doubtless he believed firmly in his heroes Eric the Red, Thorfinn and Leif, "Eric's son," and in Lief's voyage westward in the year 986, in the course of which he came to Vinland. The wonders of this new land, set down by Hank, were not only the plentiful wild grapes, but the fields of waving grain which seemed to the discoverers to have sown themselves.

Leif's voyage into the setting sun could only have brought him to the shore of Greenland, or to some point on the coast of North America. Neither Greenland nor our Atlantic seaboard knows any wild wheat, rye, oats or barley. These grains were brought to the new world from Europe. Were the self-sown wheat fields which amazed these Icelanders fields of maize? Had the creation of the Maya traveled so far?

Accepting the theory that the fields were maize, which does not flourish north of Nova Scotia, certain historians have located Vinland as the country around Massachusetts Bay. The

monument on the bank of the Charles River which credits Leif Ericson with the discovery of America in the year 986 may be said to be founded on corn.

Somehow, the evidence of those "self-sown wheat fields" makes it easier to believe in Leif's reaching these shores than in the Irish monk Brendan who reputedly set sail from Kerry in his coracle of brown bull's hide, and returned after years to describe a magical isle which held all the wonders of the Apocalypse; but no mention of maize. Or in the Welsh prince Madoc, son of Owen Gwynned who is said to have sailed to part of the new world and to have returned to Tintagel to sing its glories, and enlist a company of settlers who set sail into the west and were never heard of again.*

If Madoc or Brendan reached Maya-land, it is strange that their chronicles make no mention of the chief food and source of wealth of the natives.

But though these heroes may not have entered the gates of Chichen Itza, there were others who did. From the time of the Maya's coming to Yucatan, various Nahua tribes from the north, even from as far north as British Columbia, were filtering down into the Valley of Anahuac and touching the fringes of Mayan civilization. They brought their own gods with them. Chief of these was the horrible goddess of the stone hunting knife, later called by the Aztecs Itzpapleotl, "the Obsidian Butterfly"; a deity which demanded blood and more blood in return for giving man his food.

Her devotees, who had been hunters in the north, found a new food and with it a new faith when they entered the land of the Maya. Even Itzpapleotl suffered a change. An old hymn proclaims:

*Oh, she has become a goddess of the melon-patch
Our mother Itzpapleotl, the Obsidian Butterfly.
Her food is on the Nine plains,
She was nurtured on the hearts of deer,
Our mother the earth-goddess.*

* Noah Webster gave it as his belief that Madoc built the mounds in the Ohio Valley.

Doubtless it was these Nahua tribesmen, joined with some of the Maya, who became the Toltecs of Tollan, that half-mythical capital close to the present City of Mexico. The Toltecs were already on the decline when another wave of northern invaders, this time the "Crane People," entered the Valley of Anahuac. These were the Aztecs.

The legendary home of the Aztecs was Aztlan, "the Place of Cranes," which their own historians, Tezogomac and Duran, describe as "a country which we all know to be found to the north and connected with Florida." They were fierce and untiring. They poured down through Mexico absorbing what they found of the older Mayan and Toltec cultures, and making of these a civilization which became distinctly their own.

And in Mexico they found corn. They took to it with the hunger of men who have braved deserts and crossed seas. According to Prescott:

The great staple of the continent was maize. It grew along the valleys and up the steep sides of the Cordilleras to the high level of the tablelands. The Aztecs were as curious in its preparation and as well instructed in its manifold uses as the most experienced New England housewife. From the stalks they derived a sweet juice and a sugar little inferior to that from cane.

The Aztecs paid faithful court to the maize-god, whom they named Cinteotl, and whom in time they grew to think of as a goddess. Statues of Cinteotl, with a towering square headdress, and holding ears of corn in her hands, have been found in many places throughout Mexico. The face is rather reminiscent of Tenniel's illustrations of Alice's Duchess.

But the greatest of all the gods of the Aztecs was Coatlicue, the Earth Mother. Her they worshipped with a devotion approached only by that they paid to her son the god of war. Of the twenty thousand human sacrifices that are computed to have been offered annually in the temples of Mexico, it is impossible to say how many were laid at the dragon feet of Coatlicue in hopes that the stream of blood would increase

her fertility, and that her worshippers might expect plenteous harvests. They praised and worshipped the fecundity of the earth even while they recognized its terribleness, and represented it with symbols of horror.

Mother Earth was given the form of a dragon, with claws for hands and an animal mask. Her clothing was a skirt of writhing serpents and a cloak of the skin of a sacrificed woman. On her breast hung a necklace of human skulls. Well the Aztecs knew that Nature is creator and destroyer; is beneficent and cruel; and that her bounty is not without dangers for man. Always they besought her for the gift of their daily bread, but always, with strangely prophetic insight, they shrank from what she had to give them with that bread.

The twelfth and the thirteenth centuries saw the rise of two great empires in the two Americas, that of the Aztecs in Mexico and that of the Incas in Peru. Both derived from the Maya, though the link between Cuzco and Yucatan is more difficult to trace than that between the Maya and the Crane People.

Every historian commenting on Indian life has pointed out that the cultural level of the natives of South, Central and North America is marked by two signs, the use of adobe blocks or stone in building, and the irrigation of the maize fields. These two arts were the contribution of the Maya.

Before the first Incas, who were llama-herders living in the mountains southwest of Cuzco, came down and took possession of the pleasanter valleys, the valley tribes had maize. The earliest native food in Peru was the potato. The most primitive pottery found in the ruins is shaped in imitation of the brown tubers and dotted with "eyes." But at some unrecorded time in their history the Peruvians became corn-planters. In the National Museum in Lima is an antique vase of painted clay with a realistic decoration of a stalk of tasseled corn. At the time of the Conquest, the Spaniards saw four

cultivated varieties of maize growing in the irrigated fields, and no wild varieties anywhere.

The Incas, with their extraordinary genius for government, developed the agricultural life of the tribes as the basis of society. Their worship of the sun they linked with the tribal devotion to the earth goddess. The Inca chief announced to the world that spring had come by turning the first furrow in the maize fields with a golden plow. The epitaph which Inca Pachú composed for himself has been translated:

I was born like the maize in the field.
Like the maize, I was cherished in my youth.
I came to maturity, I was spent,
Now I am withered, and I die.

Inca culture surpassed that in every part of the Americas because the Peruvians knew the use of bronze in weapons and tools; they domesticated the llama which enabled them to practise field agriculture, and they manured their lands with guano. There was no need for them to move the *milpas* every third or fourth year, as the Maya and the Aztecs who did not fertilize their fields were forced to do. In four centuries they spread an empire from northern Peru across Bolivia and into northwestern Argentina. It was an empire in which justice and mercy were set before cruelty. The Peruvians offered no human sacrifices to their Lord the sun or to any of the lesser deities. No human blood stained their altars. Nor can the charge of cannibalism be laid against them, as it can be laid to the Aztecs. Garcillasso comments with the awestruck wonder of one who had seen the armies of Castile glut themselves at the sack of Granada, that by Inca law it was a crime punishable by death for a soldier to pillage. Moreover, he remarks, "the penalty was exacted."

As among the Maya, the Inca system of land tenure was communal. Each village held title to its fields which were allotted, one *tupa* to every married man—not to own, but to till. When a son was born, the father was granted one *tupa*

additional. A daughter was rated at half a *tupa*. From time to time the village lands were re-allotted, thus keeping the title vested in the community, not in one family or in an individual. The crop raised in the communal fields was divided into three parts, of which one part belonged to the Inca, one to the priesthood and one to the people. The people's third was rationed among all who had taken part in the sowing and cultivating. If a man was absent with the army, he was given his allowance of maize out of the share set aside for the Inca. If he had not taken part in the village sowing because he was working on one of the church buildings, then his ration was paid to him out of the priests' share of the crop. It was a planned society in which no allowance was made for idlers or for millionaires.

Perhaps it had been planned too well. Perhaps it made too little difference to the tribes whether they gave the first third of their crops to the Inca or to a Spanish governor, and whether the second third went to the priests of the sun or to the new order of priests who set up a cross and the statue of a woman crowned with seven stars and standing on the crescent moon, in the very temples where formerly hymns to the sun had been chanted. After all, what was all-important was the people's third. So long as that third part remained to the people, and it was sufficient for their bodily needs, it mattered little whether the rule was with the Incas or with Spain.

For at least three centuries before the coming of the Spaniards, twilight had fallen on the Maya. Like Copán and Palenque, Chichen Itza was deserted. Where did the Maya go? No one really knows. The Seminoles of Florida have a legend that the founders of their nation were seven hundred Maya who came by boat up the Suwannee to the great Okefenokee Swamp where they joined the Creeks. Some time later the two tribes agreed to separate; the Seminoles—the name is said to mean "Wanderers"—moved south into the Everglades. But seven hundred "Wanderers" do not account

for the great nation that once held Yucatan. Probably many of the Maya were assimilated by the Aztec confederacy. Doubtless many more died at the hands of the Caribs who were in the habit of swooping down on the coast towns of the isthmus burning and killing, carrying away women and a number of young men who were not too sinewy to make a stew.

Too, for nearly two hundred years before Cortes, the Maya were torn by civil war that raged between two rival families—the Cocoms, whose totem was a pheasant, and the Kius, whose emblem was a plant. The Mayan Wars of the Plants and the Pheasants were worse than the British Wars of the Roses. They exhausted the last strength of the first corn-planters. In the course of the struggle, the *milpas* were deserted, the granaries burned. There was little energy left in the Maya to resist the white men who landed from enormous ships, and who rode inland on great beasts, the like of which had never been seen in the Americas before.

Cortes and his army passed through Maya-land meeting with amazingly little opposition, and up into the mountains toward the Valley of Anahuac. It was August; everywhere their eyes rested on fields of golden corn.

The Aztecs and other tribes of the Nahua confederacy which at this time controlled practically the whole of Mexico had greatly improved their primitive husbandry. Though they did not know the use of iron, they had tools of copper and tin, and plows of hardwood. They irrigated their fields, and there were strict laws to protect the forests which safeguarded the rainfall. The Valley of Anahuac was magnificently wooded until the Spaniards denuded it of its cypress and larch groves, as they had previously deforested Moorish Andalusia.

Having a cereal—maize—which yields a harvest when it is merely scratched into the earth and left to itself to mature, and which, when planted in tilled land, gives, with very little cultivation, twice as much food per acre as any other grain, the Aztecs had attained to great land wealth. Taxes were paid in maize which was gathered into the national granaries and

became money. There seems little doubt that the Indians living north of the Rio Grande, the pueblo-dwellers of Zuñi, Acoma, Taos, the cliff-dwellers of Pecos, and others, traded in Tenochtitlan and carried back to their desert lands grains of maize and ideas of irrigation.

Gradually, as the tribal wealth of the Aztecs increased, they had evolved a system of slavery. Those who committed misdemeanors were deprived of membership in the tribe, and were reduced to the lowest caste. A man who neglected his garden for two years fell under this ban. He wore a wooden collar about the neck; labored for a master and received for his work not a share of the crop, as did the other "communists," but what his owner thought was sufficient to keep him in good working condition.

As among all the Indian tribes, the lands were held and worked communally. The basis of the commune was the family. Even in the cities every family lived to itself in a separate pueblo which housed two or three hundred persons of close relationship. Over the doors of these "Palaices, curiously buylided with many pleasant diuises," as Richard Eden describes them, was carved the animal totem of the family, and on the jambs, the writhing serpents of Quetzalcoatl, late Kukulcan, who had now become the legendary father-founder of the Aztec nation. From these pueblos the men of the family went forth to work the lands for which that family was responsible to the tribe.

As Cortes and his men rode higher into the hills, they came to cities like Tlascala, well named "Place of Bread," a town of thirty thousand set down in spreading cornlands; and where the natives battled with them. And to Cholula where stood the pyramid—the temple of Quetzalcoatl, larger than the Great Pyramid by the Nile and covering forty-four acres. Then again they took up the march, climbing the mountain wall that rims the Valley of Anahuac, led by their Tlascan guide through the pass between the two smoking volcanoes. At the top of the divide they drew rein to feast their eyes on

the beauty that filled the vale. There lay the broad, forested highland, with its linked lakes and the white towns built on their islands. There were acres and acres of cultivated maize fields running up the inner wall of the mountains, separated by hedges of cactus and yellow-flowering aloes. There were the floating gardens—rafts thirty to fifty feet long covered with rich loam in which grew beans, tomatoes, hot peppers and the inevitable maize. These were moored in shallow places in the lakes, and helped to supply the city dwellers with food. There were the great palaces with their courts and outer buildings, impregnable positions of defence, as the Spanish warriors immediately noted. There were the flat house-roofs, planted with flowers—cosmos and dahlias, marigolds, sun flowers, petunias and sky-blue morning glories. And rising like a sentinel, the royal Hill of Chapultepec, with its crown of virgin cypress.

It was a fantastic, multi-colored civilization, set like a jewel in the wilderness of the new world. Small wonder that the chroniclers of the conquest compared Tenochtitlan with the coffered palaces of Granada.

The Montezuma had sent a royal palanquin to bear the emissary of Spain into the capital in triumph. The chair, carried by warriors in feather cloaks, with necklaces and bracelets of turquoise and silver, and helmets of painted wood adorned with feathers, was hung with curtains of padded cotton to shut out the sun. Above it floated the green plumes that were the symbol of the Aztec chief, a symbol adopted in honor of the maize-god.

So enthroned, Cortes was borne over the causeway and into the city whose fall he plotted. Borne under the waving green banners of the Corn. . . .

There was a prophecy in this, had any of the Aztec soothsayers been able to read it.

The Montezuma spread a feast for the strangers. "They had been long enough in the country to become reconciled to, if

not to relish, the peculiar cooking of the Aztecs.”* It is not to be supposed that the emperor gave his guests fewer dishes or less carefully prepared ones than graced his own banquet floor. Bernal Diaz has given us a few items of the royal menu. The first cover was a fricassee of infants. This was followed by game from the royal preserves and fish, caught only the day before in the Gulf of Mexico two hundred miles away and carried by relays of swift runners to the emperor’s kitchen. After these solid courses came sweetmeats and pastry made of maize flour, eggs and the rich sugar of the aloe. “Two girls were occupied at the further end of the emperor’s dining hall in preparing fine rolls and wafers which were set before him from time to time. He took no other beverage than chocolate, flavored with vanilla and other spices, and so prepared as to be reduced to a froth of the consistency of honey, which gradually dissolved in the mouth. This was served in golden goblets with spoons of the same metal, or of tortoise shell finely wrought.”

No less than fifty pitchers of this beverage were prepared for the Montezuma’s daily consumption!

In the market place of the capital, the Spaniards stood amazed at the varieties of wares offered, and the traders from all parts of the empire: “the goldsmiths of Azcapozalco, the potters and jewelers of Cholula, the painters of Tezcuco, the hunters of Xilotepec, the fishermen of Cuitlahuac, the fruiters of the warm countries and the florists of Xochimilco.”* And everywhere the “unfailing maize.” Everywhere were booths where tortillas were baked and sold, where tamales, hot with pepper and sweet from the corn husks in which they were wrapped, were offered. From all quarters of the city, over the painted drawbridges, came peasants with baskets and sacks of maize.

And in and out of the temples dedicated to Coatlicue and to Cinteotl, and to Chicomene Coatl, a harvest divinity called

* See *The Conquest of Mexico*, William H. Prescott.

variously "Seven Snakes" or "Seven Maize Ears" (one of the aspects of Coatlicue), the crowds poured. For it was harvest time, when thanks were due Chicomene Coatl for her gifts, and before she was supposed to leave her children for a visit to the magic isle of Tlalocan in the west, where, according to Aztec belief, the maize-god was born.

The crowds on the temple steps chanted the harvest hymn:

*Goddess of the seven ears, arise, awake,
For, our mother, thou leavest us.
Thou returnest to Tlalocan.
Arise, awake,
Mother, thou leavest us now.
Thou goest to thy home in Tlalocan.*

All day long, and through many days, the golden tide poured into the city. The Spaniards watched and wondered. Here was no poverty such as crept through the dark lanes of Toledo and Seville; no hunger, no threat of famine. They saw the maize mount in the Montezuma's treasury, and in the granaries of the temples. They heard, as Sahagun tells, the songs of the corn-bearers:

*Oh, the yellow blossom has flowered,
She, our mother,
With the thigh-skin of the goddess
Painted upon her face. . . .
She has come out, come out from Tlalocan,
The white blossom has burst open. . . .*

Yet this great empire with its magnificent cities, its extensive agriculture, its stores of food, fell to a small band of Spaniards who were thousands of miles away from their base of supplies, aliens in a strange land.

It has been said that it was not the Spaniards but their horses that conquered Mexico. Actually, the destroyer of the Aztecs was neither of these. It was nothing that came in the Spanish caravels. The peoples of Mexico were conquered by the goddess whom they had served so long and so devotedly.

Coatlicue, whose destroying fecundity they both worshipped and feared, turned against them.

The history of all peoples, as Buckle so ably pointed out, is the story of the effect upon them of four forces which lie outside themselves: climate, food, soil and the general aspect of nature. To the last, with its power to stir man's imagination, we owe religion, superstition, poetry and art. The other three are closely linked, and react upon each other. Their immediate result is evidenced in the accumulation of a people's wealth which forms the basis of society.

In lands where a warm climate makes man prolific, and where a rich soil gives an abundance of food which is also cheap, it is inevitable that there shall be a wealthy leisure class and a class of serfs. This had happened in Peru and in Mexico long before Columbus opened the way to their shores. The maize-fields of Mexico yielded from *four hundred to eight hundred fold*. Coatlicue did well by her children. Too well. Her gifts of increase enriched one class while it made millions of peons. The Montezumas could afford dinner services of gold and a menu of rare foods. What if the runners panted their hearts out carrying fresh pompano from the Gulf fishermen's nets to the emperor's table? There were more runners. And still more. In a land where corn was cheap, men were cheap. Two hundred thousand laborers could be put to work on a single palace in Tenochtitlan. Wages were next to nothing, since maize was so plentiful. And what more did a slave require than his daily ration of tortillas and chocolate; a blanket to cover him, sandals woven of palmetto leaves and a palmetto hat to keep off the rain and the sun? All of these Mother Earth provided with lavish generosity.

In the long list of national debacles, it is the societies which are divided internally that go down under external pressure. Foreign conquerors win when they have allies within—the allies of social decay and degeneracy.

Though the Mexicans did not know it, Coatlicue was already in league with the invaders. She threw wide the gates. Surely

the Aztecs had a premonition of this, else they had not made the earth goddess horrible.

The cities of Montezuma fell, and the smoke of their burning spread over the trampled cornfields. The Spaniards rode north across the Rio Grande. Coronado marched over one thousand miles of desert in search of the wealth of the Seven Cities of Cibola. What he found were the pueblos of Zuñi, and the maize-fields spreading into Kansas.

Castañeda, who rode with him, counted no fewer than eighty inhabited towns in that particular section of the American southwest. Their inhabitants were corn-planters, for in front of the Spaniards the maize had already moved into the north.

Cabeza de Vaca, who crossed from Florida to the Rio Grande in 1527, commented on the maize-fields he saw. Cartier saw great fields of it on the site of Montreal in 1604. Marquette, Joliet, La Salle, Hennepin reported it as the chief food of the tribes in the Mississippi Valley.

Through the passes of the Rockies, across the plains of Nebraska, to the forested headwaters of the Mississippi and the Missouri, to the shores of the Great Lakes and the St. Lawrence; over the Alleghenies to the Chesapeake and the Potomac; through the valley of the Hudson and across the Mohawk Trail to the Connecticut and the Merrimac, the corn had traveled.

Those who carried it knew the value of the grains. They kept the legend of its divine birth. The Senecas and the Iroquois added new tales of their own devising. But each of those who received it called it by a name which meant "She Who Feeds Us."

Cinteotl still lived.



III

Corn Conquers Virginia

I TELL thee 'tis a goodlie country, not wanting in victuals. On the banks of those rivers are divers fruits good to eat, and game a-plenty. Beside, the natives in those parts have a corne, which yields them bread; and this with little labor and in abundance. 'Tis called in the Spanish tongue 'mahiz.' Spain . . ."

Walter Raleigh, recently breveted Captain, by the Queen's graciousness, brought his fist down on the table-board with such vehemence the ale in the pewter tankards leaped over the rims. A murmur ran round the company gathered in The Mermaid's common-room:

"Spain. . . ."

The name was spoken like a curse.

It was a way many Englishmen spoke it in those days when the news was common property that King Philip was outfitting a fleet the like of which no power yet had ever launched upon the seas, which he purposed to send against England.

Spain. . . . No longer was Spain a backward country prisoned between the Pyrenees and the Arabs, and too concerned with her own feudal warfares to take part in European affairs. Spain had leaped over the wall of the Pyrenees. The marriage of poor, half-witted Infanta Juana to the Hapsburg princeling, which had been paid for with the first booty brought from the Americas, had produced a son who wore the title of Emperor, and who had marched across France and Italy and the Low Countries.

Now, with the tide of wealth pouring into Cadiz from the New World, there was no stopping Spain. And this, so Eng-

lishmen felt, was a distinct slap in their faces. While they had been undergoing the throes of the Reformation, Spain had been stretching greedy hands into the west. True, for a half century and more there had been merchants in the City who had been thinking of the possibilities of trade with Spanish colonies in the Americas, and sent factors there in advance. Hakluyt refers to a Thomas Tison, who several years before 1526 lived in the West Indies and "seems to have been some secret agent for Mr. Thorne and other English merchants." Too, when Edward Fenton made his epochal voyage to China in 1582, he found in Brazil "an Englishman named Richard Carter, born in Limehouse, who had been out of England four and twenty years; and near twelve years dwelling in the River Plata at a town named Ascension, three hundred leagues up the river."

But the Pope had declared the Americas to be the sole property of Spain and Portugal; and this, despite the fact that an English seaman, stout John Cabot, had sailed his own ship to the New World while Columbus's caravels were still churning up the waters, and claimed for King Harry a part of the continent Spain had never touched.

Was it not time England laid hold of Cabot's claim? Could not England, as well as Spain, profit by additional wealth? And would not colonies overseas answer the problems of overpopulation, unemployment, high prices and low wages which had been brought about largely by the turning of farms into sheep-grazing lands, and the overdevelopment of the wool trade at the expense of grain?

So argued Captain Walter Raleigh. He gave voice to his belief everywhere he went; in the Queen's presence, in the councils of the Navy where stout sea-dogs like Drake and Frobisher heard him with respect, and in the ale houses of London, whenever he and the company he loved to keep—sailors, adventurers and poets—came together for a pint or two.

It was said, with a grin, there never was an Englishman so mad to get himself and others out of England as was Raleigh.

Still, for all that, he knew whereof he spoke. He himself had sailed to the New World. He had seen that amazing country of the red savages with his own eyes. Recently, he had dispatched an expedition at his own expense to report on the advisability of an English settlement there.

His captains, Amadas and Barlow, were returned with their findings; they had found it truly a "goodlie land" with "the highest and reddest cedars of the world, far bettering the cedars of the Azores. The king sent us every day a brace or two of fat bucks, conies, hares, fish . . . the best in the world. He sent us divers kinds of fruits, melons, walnuts, cucumbers, gourds, peas and divers roots and fruits, very excellent good; and of their country corn, which is very white, fair, and well tasted, and groweth three times in five months. In May they sow, in July they reap; in June they sow, in August they reap; in July they sow, in September they reap. Only they cast the corn into the ground, breaking a little of the soft turf with a wooden mattock or pickaxe. Ourselves proved the soil and put some of our peas in the ground and in ten days they were fourteen inches high."

The country so highly praised was that lying round Pimlico Sound. With characteristic enthusiasm Raleigh had set about forming a colony of planters.

It was no mean company that sailed under Ralph Lane in the seven ships of Sir Richard Grenville's fleet. One of the youngest of them was a nineteen-year-old lad from Suffolk, Thomas Cavendish. Three years later he was to command three ships and chase the Don from the Pacific with a thoroughness equal to Drake's, and then come back to England having circumnavigated the globe. Another was the mathematician Thomas Hariot, several of whose theories Descartes was not above appropriating. Still another was John White, destined to become the grandfather of the ill-fated Virginia Dare.

They found the country as Raleigh's captains had reported it. But what interested these Elizabethan adventurers was not

the "greene soils of the hills" but the river sands, from which, remembering the treasure Spain had unearthed in Peru and Mexico, they hoped to dig gold. Leaving their goods on the shore, they waded barefoot into the streams scooping up the gravel with their hands and panning it in the copper saucepans they had brought. Meanwhile, over their heads, floated the golden pollen of the Indian maize fields—a dust far richer than any these sands could yield.

Grenville went on an exploring expedition along the southern shore of the Sound. In the course of it he passed through several Indian villages surrounded by "the goodliest corne fields that ever were seene in any country." The natives showed themselves not unfriendly. In a village called Aquascogoa, Grenville missed a silver cup from his mess-kit. He promptly accused his hosts of theft, though there is nothing to prove that the culprit was not one of his own crew. Maintaining the British code of the time, which made theft even of articles of little worth a crime to be punished severely, Grenville promptly burned the granaries of Aquascogoa and sent his men into the growing maize fields to spoil the crop, "all the natives having fled." To the Indians, who made the destruction of corn a crime punishable by death, the act must have been horrible to the extreme.

Having made a demonstration of British law, order and righteousness, Grenville returned to Roanoke and his ships, and sailed for home. He left behind him the little colony to pay the debt of his stupidity.

But thus far the colonists were all enthusiasm. Ralph Lane wrote to Hakluyt:

We have discovered the main to be the goodliest isle under the cope of heaven, so abounding with sweet trees that bring such sundry rich and pleasant gums, grapes of such greatness yet wild, as France, Spain nor Italy have no greater; so many sorts of apothecary's drugs, such several kinds of flax, . . . And now within these few days we have found here maize, or Guinea wheat, whose

ear yieldeth corn for bread, four hundred upon one ear; and the cane maketh very good and perfect sugar . . .”

Your most assured friend,

Ralph Lane

From the new fort in Virginia,
the 3rd of September, 1585.

Had the others of the settlement followed Lane's example and turned their attention to the produce of the land, instead of to that avid search for gold, the winter's tale which the gaunt survivors had to tell Sir Francis Drake when he put into Pimlico Sound the next summer might have been different. It was a tale of famine and death, of the enmity of the Indians who had not forgotten the stench of scorched corn that floated over Aquascogoa; of a heartbreaking lookout for relief ships that never came over the horizon. How could the Virginians know that England had commandeered all ships to send them against the Armada? Or that Raleigh's *Ark Royal* which he was building for the Virginia trade had been bought off the ways by the Queen for £5,000 to be the Admiral's flagship.

Drake was hastening home with the loot of San Domingo, eager to take part in the coming sea fight in home waters. When he sailed, young Cavendish went with him. He had had enough of planting; now he purposed to be a sailor, and as close after the pattern of "El Draque" as possible. There sailed, too, Thomas Hariot and John White. These took with them the one harvest of that year in Virginia. It was a manuscript entitled: *A Briefe and True Report of the New Found Land of Virginia*. In its pages Hariot set down with the exactitude of the mathematician a description of the land round Roanoke, its plants and animals, minerals and natives, all of which John White illustrated with drawings and sketches in water color. Hariot gives much space to telling of the plants that were the chief crops of the Virginia natives, especially tobacco and "pagetour, the same in the West Indies is called maize. The grains are the size of our peas, of divers colors and yield a very

white and sweet flour. . . . "It maketh a good bread." He describes the Indians' methods of planting and cultivation, and estimates that one English acre "forty perches long and four wide, yields 200 London bushels of maize and beans." In England, he adds, a wheat yield of forty bushels per acre is considered a plenteous harvest. It is to Thomas Hariot's accurate eye and mind that we owe our knowledge that the Indians of Virginia planted their corn, four grains to a hill, "set not to touch," in the pattern of the Maya, and immortalized by them in their day-sign for planting.

An edition of Hariot's work was printed in Frankfort in 1590. This, and John White's earnest pleas that the settlement in Virginia should not be abandoned, but encouraged and aided, did much to stir England out of the lassitude which came over her when the lively menace of the Armada had been reduced to ashes. White had returned to Virginia with a new company of settlers, among them his daughter Eleanor and her husband, Ananias Dare. Even after tragedy had overtaken the second colony, leaving only the charred ruins of houses, a baby's shoe and the word CROATOAN cut on one of the trees, White persisted in advocating a settlement in Virginia. He pointed to Hariot's *Briefe and True Report* and to his own illustrations to prove the richness of the land, and that it would support planters, provided these dig in fields, not in the river sand.

Gloriana was dead; Raleigh was in the Tower. Jamie the Scotsman, with the reek of whiskey on his breath, had brought a tradesman's point of view to Whitehall. Swashbuckling adventure was regarded askance. But a merchant company, with such estimable directors as Sir George Somers, Sir Thomas Gates, Captain Edward Wingfield and the Reverend Richard Haklyut, cousin and namesake of the famous author of *Voyages and Discoveries*, and himself a writer whose *Principal Voyages*, was influencing the minds of Englishmen; a company with shares to sell, and dividends to reap, a company chartered to

exploit the New World and whatever it might yield, King James could approve of that. After all, Virginia might accomplish for him what no Stuart could ever succeed in doing—balance the budget.

The colonists who set sail on New Year's Day, 1607, in Captain Newport's ships carried with them explicit directions from Rev. Richard Haklyut. It was sound counsel he laid down. He recommended among other things,

You must have great care not to offend the naturals, if you can eschew it; and employ some few of your company to trade with them for corn and all other lasting victuals . . . And this you must do before that they perceive you mean to plant among them. . . .

You must take especial care that you choose a seat for habitation that shall not be overburthened with woods near your town, for all the men you have shall not be able to cleanse twenty acres a year. . . . Neither must you plant in a low or moist place because it will prove unhealthful. . . .

Lastly and chiefly, the way to prosper and to achieve good success is to make yourselves all of one mind for the good of your country and your own, and to serve and fear God, the Giver of all goodness, for every plantation which our Heavenly Father hath not planted shall be rooted out.

The expedition was well advertised. Newport's ships drew sightseers who were curious about America and its natives. Captain Weymouth had brought back from his voyage to Maine in 1605 five naked savages, with painted faces and long hair adorned with feathers. An enterprising showman had touted them about England with good monetary returns. Shakespeare's complaint that men too miserly to tip a beggar would "lay out ten doits to see a dead Indian," was not unfounded. In market places, in village taprooms, in barracks from Penzance to John O'Groats men were discussing Virginia and the possibilities it offered for better living than they had in England.

No meaner copywriter than Michael Drayton waved Newport's fleet to sea with the exhortation:

Singing Valleys

*Britons, you stay too long,
Quickly aboard bestow you,
And with a merry gale
Swell your stretched sail,
With vows as strong
As the winds that blow you.*

*And cheerfully at sea,
Success you still entice,
To get the pearl and gold,
And ours to hold
VIRGINIA,
Earth's only paradise.*

*Where nature hath in store,
Fowl, venison and fish;
And the fruitfull'st soil
Without your toil,
Three harvests more,
All greater than you wish.*

There was one member of the expedition who, if those lines happened to catch his eye, must have frowned and sworn roundly.

"Without your toil . . ." A pox on poets! 'Tis such windbags as he that have enlisted these fine gentlemen with the white soft hands, and no guts beneath their slashed doublets, to be planters. Planters . . .

So, undoubtedly, thought Captain John Smith, veteran adventurer and practical realist. The Directors of the Company dubbed him dangerous and insubordinate. He reached Virginia in irons. It was only several weeks later, and after Captain Newport, who recognized the qualities of leadership in John Smith, had prevailed with the other members of the Council, that the irons were struck off and Smith was permitted to exercise his authority as a Council member. There seems to have been little doubt in the minds of the rank and file that the Captain was the best man of the three whom the Company Directors

had entrusted with government of the colony. One of the handful who survived the Starving Time in the winter after Smith had left Virginia wrote of him that "He would rather want than borrow; or starve than not pay. He loved action more than words, and hated falsehood worse than death; whose adventures were our lives, and whose loss our death. . . ."

That the planting made in the early spring of 1607 survived, and finally gave birth to a nation, is due to the sheer capability of John Smith. He looms out of the records as one of the truly great men in our national history.

Born with an insatiable curiosity about the world in which he lived, and with a capacity for adventure at first hand, his report of himself is that he had served in France under Admiral Coligny, who discussed with him the advisability of planting a colony of Huguenots in Florida; in the Low Countries against Spain, and in Transylvania, fighting the Turks as one of Sigismund Bathory's captains. There he slew in single combat three Ottomans and was awarded a coat-of-arms showing three Turks' heads on a shield. Later, he was taken captive and enslaved. He escaped only by killing his owner who had set him to threshing wheat, seizing his horse and galloping away into Russia. Then he journeyed by adventurous paths across Poland, Bohemia, Germany, France, arriving in London in time to hear the propaganda put out by the Virginia Company, and to decide on America as his next field of action.

And all this before his twenty-seventh year.

The recital of his adventures, told tersely in his own words, would seem to place him among the rashlings. But John Smith was no d'Artagnan. He had executive ability, as shrewd a sense of values as any city merchant, and a comprehension of economic factors in government rarely met with in his time and in the class to which he belonged—that of the professional soldier. This was proven during the two years of his stay in Virginia. In the course of that time he saved the colonists from starvation and massacre by his skill in handling the Indians, buying corn from them and learning from them all

that he could about the country and what it had to offer. At the same time his repeated injunction to the colonists was that in order to succeed they must give up scanning the horizon for supply ships from the mother country, and turn to the land itself for their subsistence.

It was not an easy task to persuade the first Virginians against those flowery promises of Drayton's that they must become planters, not adventurers; and that their survival depended on their driving roots into the soil. "He that does not work shall not eat" was Smith's retort to those who would have thrust their hands into the baskets of corn he brought from the Powhatan. Work, he explained, meant tree-chopping, grubbing up roots, breaking the soil with the tools they had brought from England, and which the lazy ones were only too willing to trade with the Indians for fresh-killed venison, or corn. Of the members of this First Supply, thirty-five were listed as "Gentlemen." Not a few of these were younger sons of the nobility. George Percy, who governed the colony twice—and badly—was a brother of the Duke of Northumberland. Of the other settlers, many were footmen.

The Council's choice of a site was in direct disobedience to Haklyut's admonitions. It was low and damp. The land was uncleared, showing, had they been familiar with Indian ways, that the natives considered it infertile, worthless for crops. It is likely that had Smith not been a prisoner, he would have saved them this initial mistake.

They felled logs to build a fort and when, at the end of a fortnight, this was built, they broke up the ground of the clearing they had made and sowed among the stumps the seeds of English wheat. Five weeks later, when Newport sailed on June fifteenth, the grain had grown to the height of an average man. Newport took back to the Company tales of the exceeding fertility of Virginia soil, not knowing that this very richness would prove the destruction of the first wheat crop.

In all, the settlers cleared and planted in wheat and vegetables about four acres of ground. They had as well the stores

left by Newport which, it was estimated, would last fifteen weeks, by careful rationing. Newport could not, even with favorable winds, weather and prompt aid at home, be expected to return in less than five months. The colony was faced with the necessity of adding to its store of provisions enough to carry it through at least five weeks.

Considering the plenitude of the woods and fields, this did not seem to present grave difficulties. The fringes of the pine and cedar woods offered wild crab-apples, three varieties of cherries, persimmons, a fruit of which Smith remarked, "If it be not ripe it will draw a man's mouth awrie with much torment," as well as raspberries, whortleberries, four varieties of grapes, and wild strawberries, that were four times as large as any in England and so plentiful the men trampled them as they went about the plantation.

There were also the sassafras trees, whose roots, with pine wood for paneling, were the cargo the *Susan Constant* carried home.

The woods, which were free of underbrush thanks to the custom followed by the Indians of burning out the low growth to aid them in deer stalking, yielded venison, squirrels, opossums, raccoons, quail, wild turkeys. It might be thought impossible for one hundred able-bodied men to suffer want in such a land. But as summer brought hot weather, malaria and dysentery claimed its victims. The wheat, sprung from seed which had been developed in a cooler, moister England, sickened and failed. Sooner than any of them had expected, they began to draw on the stores which were entrusted to Thomas Studley. He has left his own account:

. . . Being thus left to our fortunes, it fortuneed that within ten days scarce ten of us could either go or well stand, such extreme sickness and weakness oppressed us . . . and the reason was this; whilst the ships stayed our allowance was somewhat bettered by daily proportion of biscuit which the sailors would pilfer to sell, give or exchange with us for money, sassafras, furs or love. But when they departed there remained . . . no place of relief but the

common kettle . . . and that was half a pint of wheat and as much barley boiled with water, for a man a day; and this having fried some 26 weeks in the ship's hold contained as many worms as grains, so that we might truly call it rather so much bran as corn . . . those that escaped lived upon sturgeon and sea crabs. Fifty in this time we buried. . . .

Smith, meanwhile, had led a party to explore the shores of the Sound and to buy grain from the natives. They found many Indian villages, each surrounded by green maize fields, from twenty to one hundred acres in extent and cleanly cultivated between the hills. Strachey says that at the time the English arrived there were three thousand acres of cleared and planted land within the boundaries of the present state of Virginia. By the accounts, the palm went to the natives of Kecoughtan, the peninsula whose sea tip the English named Point Comfort, and who were "better husbands than in any parte else that we have observed."

Entries in John Smith's Journal record the corn purchases made that summer:

At the mouth of the River	16 bushels
On the South side of the River	30 bushels
From Pashpahegh (that churlish nation) . .	10-12 bushels

As Smith explored the bays and wide river mouths of Tidewater Virginia in the pinnace which was an important part of the colony's equipment, he became more and more impressed by the cultivation of the corn lands. The rows were four feet apart, and the soil between them was kept clear of weeds by the women of the village who used their wooden hoes industriously. This method of tillage was new to the English. In Britain, at that time, most seeds were sown broadcast. Hariot had commented on the good results of the Indians' method. Squashes and "pompions" grew between the hills. The stalks, according to Smith, usually bore two ears. Occasionally there were three, rarely four, to a plant. The ears were well filled out

with from two to five hundred kernels. Also, the Captain noted, the green stalks cut and sucked, yielded a sweet juice.

To ward off the herds of deer, the marauding squirrels, crows, buzzards and woodchucks, four cedar trunks were set up in the center of each field, with a platform atop them, where a young lad was kept on sentinel duty. John White's sketch of the Village of Secota in Hariot's *Briefe and True Report* shows a neat street, with bark houses ranged along it, fields of tobacco fenced with sunflowers and fields of corn in various stages of growth. In the most advanced planting is one of the watchtowers. Every village, too, had its granary, set up on four posts. Le Moyne pictured a round granary with a conical roof in his description of sixteenth-century Florida.

The prestige of the tribal rulers was measured in their maize fields. The Queen of Appomattox was mistress of one hundred acres of beans, squashes, pumpkins and many corn lands.

Here, John Smith saw, was the readiest and most necessary wealth Jamestown required—food. As the English wheat drooped and parched under the July sun he contrasted it with the vigorous growth of the Indians' maize. Why, he demanded of the Council, cram the holds of the ships with seed from England which was alien to Virginia soil, when right at hand was a native grain which yielded plenteous harvest under even primitive methods of cultivation? Let the settlers forget the white loaves of Lincolnshire and eat the American yellow bread, which apparently had power to nourish warriors and keep them vigorous to an age when English graybeards were tottering. The Powhatan himself was eighty years old. Yet there was not a white man in Jamestown who would have chosen to match his physical strength against the red king's.

By December the stores in Thomas Studley's warehouse were exhausted. The colony had dwindled to one-half its original number. These were living on wild game and *mattoum*, the seed of the wild barley growing on the river banks. Ahead stretched four months of winter, and all around were the savages. Smith proposed to the Council that they allow him the

shallop and nine men. He would add to the party two Indians who were disposed to be friendly, and go up the Chickahominy where there were large villages with presumably well-stocked granaries, and barter for corn to keep the settlers alive.

So began the well-known adventure of the bearded Captain and the twelve-year-old daughter of the Powhatan. In being captured and threatened with execution, Smith was only being made to pay for the kidnapping of Indians by every ship's captain who touched the Americas. When Verrazano landed on the Carolina shore he stole away a child and tried to carry off a young woman. Only her screams and the savage resistance she put up made the Breton sailors desist. Again and again Smith made the point in his arguments with the Council that honest and cordial relations with the natives were necessary if the English were to remain in Virginia. For as long as hunger stalked them, they would have need of the corn of the country. Englishmen could count on having bread to eat only as long as they could count on the Indians' breaking bread with them.

Wingfield, the first President, was deposed from office on the charge of appropriating to himself too many of the stores. He went back to England and there published a pamphlet in his defense. It was another *apologia*, to follow de Landa's, and to add another chapter to the history of the corn-planters.

Wingfield was no friend to John Smith; it was he who had ordered the irons put about the Captain's wrists. But Wingfield states frankly that the survival of the English cause in Virginia was due to Smith's canniness in trading with the Indians for corn, and to his shrewd recognition of the importance of the natives' grain as a crop for the settlers to grow for themselves.

Again and again, in the two years before he was forced by serious injuries which lay beyond the skill of the colony's barber to cure, to return to England, John Smith went corn-trading. In the course of those expeditions he spied out the land and gathered the facts he put into his maps. He sailed up

the James River to Powhatan's "Birthright; whereon he sows his wheate, beanes, peaze, tobacco," and now the site of Richmond. He investigated the York and the Pamunkey Rivers. So he sensed the greatness of the continent behind and beyond the source of those rivers. Here was no narrow isthmus such as the Spaniards had found in Yucatan, with China on the far side of it; but a rich and varied firmament about which he was insatiably curious. Everywhere he went he found corn. And of every tribe whose language he learned to speak he inquired concerning their discovery of the maize.

Still Jamestown had to buy its corn, giving for the basketfuls, knives, tools, blue beads, clothing, mirrors, as well as occasional luxuries from the stores Newport and Captain Nelson brought. Only in the spring of 1609, when John Smith was President, was he able to set the first cornfield in Jamestown. Two Indians, Tassore and Kemps, captured the winter before, "fettered prisoners and as evil a pair as would sell their king for a piece of copper," were told off to instruct the settlers how to break the ground and set the seed. One is glad to read that for this service they were given their freedom. Smith's cornfield comprised forty acres. It flourished as had nothing else the settlers had planted. When Newport arrived with the third supply, the new colonists seized on seven acres of the field and in three days had eaten every ear of the yield.

Jamestown had bread to eat. Jamestown had squirrel stew and venison and roasted turkey, and compotes of raspberries sweetened with sugar pressed from the green maize stalks. Pocahontas was responsible for some of this. As Smith wrote Queen Anne, commending to her the Princess in whose honor scores of English inns hung out the sign, "The Belle Savage,"

Jamestown with her wild train, she as freely visited as her father's habitation; and during the time of two or three years, she next under God, was still the instrument to preserve this colony from death, famine and utter confusion.

Such was the weakness of this poor Commonwealth. As had not the savage fed us, we directly had starved. And this relief, most

gracious Queen, was commonly brought us by the Lady Pocahontas. . . .

Behind John Smith's stern insistence that the colonists plant as well as buy corn, was his awareness that if once the Indians came to realize that the whites were dependent on them for food, more than half the value of the muskets and gunpowder in Jamestown's fort would be lost. He had evidence that already the Powhatan suspected this. On one of Smith's corn-trading expeditions, the King held out against giving him the corn bargained for except at the price of a musket a basketful. Only the cleverness of Smith, when the Indians surrounded the house where he and his men were lodged, saved them from massacre. Only his firmness with the Powhatan, refusing the powder and firearms, even though this might mean that the colony would have to tighten belts, made the wily savage sell his corn for the price bargained for.

But in that summer of 1609, John Smith's eyes rested frequently on the forty acres of standing corn within the palisade of Jamestown. Carefully he counted the ears, calculated on the grains. Here were bread and hominy. Here was hot porridge to put heart into men who had the wilderness before them. Here was security. Here was Virginia's future.

Within a few weeks the Captain was to meet with the accident which so crippled him that Newport insisted on taking him back to a London surgeon. Without his practical advice, the colonists did not save the corn in their granary from the rats which had come in Newport's ship. Much of the harvest of that first cornfield was eaten and spoiled. The news of this leaked out to the Indians. Now there were threatening figures in the woods about the settlement. The price of corn went up and up. "If you are starving and need our corn, then pay us in muskets and gun powder. Pay or starve."

Sixty out of five hundred settlers Smith left survived the winter. These had neither strength of body nor heart to meet the Spring when the Judas trees began to flower in the pine

woods and the whiteoak leaves were the size of a squirrel's ear; infallible signs that corn-planting time had come. In the pinnaces they were starting down the river, a sorry company, having chosen all too probable death at sea to what lay behind them in Jamestown, when the topsails of Lord Delaware's fleet appeared on Hampton Roads.

Virginia was saved. Saved as much by the wisdom gathered from that bitter experience as by the supplies Delaware brought. The watching redskins soon presented themselves at the palisade eager to hand over the palings baskets of seed corn in return for trinkets, sugar and rum. Again the Virginians went into the forty-acre field in which last year's stubble still marked the rows. They swung the mattocks; they planted corn.

The colony was to suffer other setbacks from time to time but never again was there thought of abandoning the undertaking. Raleigh's dream had taken root in John Smith's corn-fields.



IV

The Seeding of New England

THERE was no shaking John Smith's faith in America. No sooner were the wounds caused by that explosion of gunpowder at Powhatan's garden healed, than he was limping about London, calling on the Directors of the Virginia Company to send to Jamestown no more remittance men from the ranks of the landed gentry, but skilled workmen; millwrights, joiners, blacksmiths, gardeners.

On his own, turning his back on the Company, he was fitting out an expedition to explore the coasts of Northern Virginia, to which he was to give the name of "New England."

There had been a settlement on the Kennebec River at the time Jamestown was founded. After a year, the survivors of the colony had trailed forlornly home to England with tales of blizzards, wolves, savages, poor soil and few natural resources. "Northern Virginia" had a black eye.

John Smith pooh-poohed all this. What if the winters were long and cold and the summers too short to grow pineapples, indigo, nutmegs and coffee? (Later, settlers in Massachusetts were to try all of these crops.) What if the brief summer season presented a difficulty in raising sufficient food to supply a settlement through a year? Were there not the fisheries off the coast to supplement the crops? And were not these fisheries in themselves worth developing as a source of revenue in England?

He pointed out to all who would hear that the Hollanders, by fishing and selling their catch to the Germans, "are made so mighty strong and rich as no state but Venice of twice their magnitude, is so well furnished with so many fair cities, goodly towns. . . . And never could the Spaniard with all

his mines of gold and silver pay his debts, his friends and army half as truly as the Hollanders still have done by this contemptible trade of fish. . . .”

Five years after his departure from Virginia, the indomitable Captain is cruising along the coasts of Massachusetts, exploring the bays and rivers; entering in his voluminous “Notes” comments on the weather, tides, coast line, the drafts of mackerel and cod, and the appearance and habits of the natives.

In the ship’s cabin, under the swinging lantern, John Smith carefully drew with sextant and ruler his map of “New England,” which was to have so far-reaching an influence on future events this side of the Atlantic. He gave names of his own fancy to “Cape Cod” and “Cape Tragabigzonda”—the last after a lady who had befriended him in Constantinople in the days of his captivity, and for whom the Captain has been supposed to have felt more tenderly than for Powhatan’s daughter. Three little islands near by he named the Turks Heads.

John Smith’s map was printed in London and widely circulated. It was in a way a sensation. In an England that was heavily in debt and floundering under Stuart rule, any suggestions for increasing the revenue were taken under consideration. “So Captain Smith believed, on the evidence of his own eyes and nets, that the waters off Northern Virginia swarmed with fish? And that these cod and herring and mackerel could be salted down, and transported to London to give British merchants a commodity with which to compete with the Dutch?” Undoubtedly Captain Smith did so believe. “But,” the dubious inquired, “how were the fishermen to be fed while so far from home? The settlers on the Kennebec reported Northern Virginia an unfriendly land and one that offered no generous supply of food.”

John Smith had an answer for that, too. “Let them eat maize.”

Maize, he reported, grew in New England as well as in

Virginia. True, the yield per acre was not so great. But as a food supply for a fishing fleet and a few fishing villages, it would be adequate. And maize, as he well knew from his experience on the James, gave its harvest with so little labor that its cultivation would not interfere overmuch with the fishermen's chief occupations. It had, he continued, other properties which gave it advantage over wheat. No mill was needed to grind it. It could be used in a variety of ways; as bread, as porridge, as hominy, as samp; or stewed with beans into a toothsome dish the Indians of Virginia called *succoquatash*. In short, Indian corn was the answer to the problem of the hour. The New England codfish and mackerel, plus the Indian corn, would balance the British budget.

Meanwhile, another result of John Smith's voyage of 1614 was developing. One of his ships, under Thomas Hunt, had coasted along the indented shores of Buzzards Bay. There Hunt, though it was strictly against orders, kidnapped twenty Patuxets. He knew better than to take them to England where the Captain's eye might fall on them and on him. Accordingly, he sailed for Spain where folks were not so squeamish about a little slave trading on the side. In Malaga he offered his captives for sale. Some friars interfered, however, and had the Indians released.

One of the twenty Patuxets, whose name has come down to us as Squanto, was taken into the service of a British merchant, the treasurer of the Newfoundland Company. He took the Indian to London and taught him to speak English. A year or two later, this same Squanto was sent to accompany Captain Thomas Dermer, "a brave, stout gentleman . . . employed by Sir Ferdinando Gorges for discovery" to Newfoundland to report on the fisheries, talk of which had been stirred up by Captain John Smith.

Leaving Newfoundland in the early Spring of 1620, at the very time the Separatists of Reverend John Robinson's congregation in Leyden were studying John Smith's map of New England and writing to the Company in London relative to

getting permission to settle there, Mr. Dermer left St. John's and sailed down the coast, stopping here and there to gather information for his report to Sir Ferdinando. He spent some weeks in the country around Cape Cod, and while there, he gave the much-traveled Squanto his freedom.

This was the Squanto whom the chief Samoset recommended to Governor John Carver as one who spoke much better English than himself. He came to Plymouth in the early Spring of 1621 and "directed them how to set their corne, where to take fish, and to procure other commodities and who never left them till he died."

Surely, it is not unworthy of remark that of the three Indians who are recorded by name as having taught the whites how to "set their corne," two remained steadfast friends of the colonists for the rest of their lives.

The first landing of the Pilgrims on Cape Cod was made in mid-November. The pin-oaks still fluttered russet leaves; but the other trees were bare. In and out between the piled sand dunes grew thickets of bay, set with waxy, gray berries. Behind these stretched dark swamps, splashed with the crimson of wild cranberries.

It was no land of plenty offering fresh food to travelers who had tossed for seven long weeks at sea. Here were no waving green maize fields such as had gladdened the eyes of Ralph Lane's fellow colonists. Instead, the first reconnoitering party of sixteen, sent out under Captain Miles Standish,

found a pond of clear fresh water and shortly after a good quantitie of clear ground where the Indeans had formerly sett corne, and some of their graves. And Proceeding further they saw new stubble wher corne had been sett the same year, also they found wher lately a house had been, wher some planks and a great kettle was remaining and heaps of sand newly padled with their hands which they digging up found in them diverce faire Indean baskets filled with corne, and some in them eares, faire and good

in diverce colleurs, which seemed to them a very goodly sight (haveing never seen any shuch before).

So their time being expired they returned to the ship, and took with them parte of the corne and buried up the rest, and so like the men from Escholl carried with them of the fruits of the land, and showed their brethren, of which, and their return, they were marvelously glad.

Later, in summing up the value to the Pilgrims of this chance discovery, Bradford spoke of it as "a spetiall providence of God, and a great mercie to this poor people that here they got them seed to plant them corne the next year, or els they must have starved, for they had none, nor any liklyhood to get any till the season had been past."

Before they settled at Plymouth, three weeks later, the ground was covered with snow, and had frozen. Under lowering skies and sleety rains that froze their hands, they broke the stiff earth and set the logs of the fort. They built the palisade which was all that intervened between them and the wintry wilderness. From the fringes of the woods dark faces peered at them. Finally, however, curiosity and greed overcame caution; the Indians approached the palisade. Trade began; an offering of an iron pot for a jacket of beaver skins. A basket of corn for a pewter spoon.

The Massachusetts Indians had no such supplies of corn as John Smith had found in the granaries of the Virginia villages. Their sandy fields, which the squaws cultivated with clamshell hoes, yielded sufficient for their own needs, and little more. They did not build granaries, but caches in the ground, such as Standish's party had stumbled on. These were lined with dry grass, the corn was put in baskets and covered over with mats woven of sweet grass. Then earth was heaped over all. Primitive root cellars, very little different from these, were part of the equipment of many a New England farm until half a century ago.

Squanto joined the despairing colony some time late in the winter, when death was taking heavy toll of their number.

He came in time to help them carry the dead out to burial, and to revive their fainting hopes with the promise of Spring.

One pictures the red man, whose travels and adventures exceeded those of the Pilgrims, clad in skins and a proud feather, summoning from memory his store of English words, and putting to them questions about London: about Ludgate Circus and the crowds around The Globe; about hawkers in the streets, crying, "Fresh cockles!" and "Sweet lavender!" and "Dutch eels, all alive-o!" Questions which the men of Plymouth, who came, in the main, from small towns and from the class of farmers and artisans, were ill fitted to answer.

They were eager to start planting. Squanto shook his head. "Not yet. Wait. . . . Soon. . . ." The English could not believe that the warm spell in March when the pussywillows burst along the withes and the skunk cabbage thrust up through the muck of the brooks' edge was not the beginning of clement weather. They had to learn the shyness of the American spring. And the slowness. They had to learn, of the red man, to stay their hands until after April's chilly rains had ceased, and the earth had dried, and the shadbush burst into misty bloom along the creeks.

Then Squanto beckoned them to follow him. He led them not into the clearing where they were eager to break ground and scatter seed, but along the estuary on which the town was built. He pointed to the tide waters flowing in. . . . They were full of leaping silver. Herring, thousands of herring, running in from the sea, and up to fresh shallows to spawn.

Here was the wealth John Smith had promised. Here were the fisheries coming right to their doors, to their feet; even, as Squanto showed them how to kneel on the bank and form a trap in the water with their loosely linked fingers, into their hands. They filled basket after basket with the catch.

The waters had brought them fresh food, and something more. The fish, Squanto made them understand, must be buried in the ground with the new corn to make it grow. Only by such fertilizing would the crop be assured to them. A fish

to a hill. A hole, four inches deep, four kernels of corn—ancient homage to the planting gods of the Maya—and the dry earth brought over them with a clamshell hoe. A month later, and the ground between the charred stumps would be a-flutter with new green leaves, and crying for the hoe again. Two months more and there would be waving tassels, with the orioles and redwings lighting on them to peck daintily. Another month, and there would be new ears full of sweet milk, to boil in the big iron pots, and to roast in the embers. And when the moon came up, big and round and golden out of the sea, there would be baskets heaped with ears as golden as the moon, to carry home and hang from the house rafters to dry.

Corn for the mortars that stood beside every hearth in Plymouth; corn for bread and nokake and suppawn and succoquatash.

They planted, that first spring, five acres of barley and peas, and twenty acres of corn, dressed carefully with herring. How did the Massachusetts Indians know that their crop of *weachin* would yield its harvest only if they fed it with fish? There was nothing in more ancient corn-lore to teach them this. The tribes of Virginia, according to Hariot, "never fatten the ground with muck, dung, or any other thing; neither plough nor dig it."

Visitors from Virginia looked on the New England corn-planting methods with disfavor. "There is not much in that land," one of them reported. "Except a herring be put into the hole that you set the corne or maize in, it will not come up." To which the men of Massachusetts retorted that the reason why Virginians did not dress their fields with fish was not for reason of the richness of their soil, but the poverty of their waters.

New Englanders continued to set their corn, a herring to a hill, for many years, and until the increase of domestic animals gave them manure. One writer tells of the wolves coming down into the Cape Cod cornfields, drawn by the smell of the

decaying fish. Later, when the herring were not so plentiful, the farmers used seaweed. Today, after a big storm has churned the Atlantic and piled the rich-colored kelp on the inset beaches of Rhode Island and the South Shore, you may see a long line of blue painted carts of the "Portygees" going down to the sea for loads of fertilizer. This, spread odoriferously on the cornfields, insures next year's crop for johnnycakes, and the roasting ears for the Republican Party's clambakes.

Because they fertilized the soil, the New England tribes were able to plant their maize year after year in the same hills without rotating their fields, as the Indians living to the south invariably did. The squaws kept the ground between the rows clear and cleanly cultivated using their clamshell hoes, and "not suffering a choaking weede to advance his audacious head above their infant corne, or an undermining worme to spoil his spurnes." The same practice of clean cultivation obtained among all the Indians of America. Strachey, writing of Virginia in 1610, comments that "the women sow their corne well and cleane same as neat as we doe our garden bedds."

The Indians scorned the colonists for their shiftlessness in letting weeds grow between their hills of corn. As soon as the first blades appeared, the squaws were in their fields, hoeing and planting three or four "Turkie beanes" in every hill with the sprouting maize. The two plants, they believed, had an affinity for each other even before they met in succoquatash.

If the Indian cornfields appeared like "garden bedds" to English eyes this was because in England field crops were still sown broadcast and there was no intertillage. The natives of the Americas had kept weeded the space between their corn rows and planted these with beans, squash, pumpkins—"cover crops"—for generations before the English agriculturalist Jethro Hull put forth his theory about "Horse-Hoeing Husbandry."

The corn which Squanto showed the whites how to plant prospered well. Every ear it yielded was doubled in value by the fact that the wheat which they had brought with them

from England, failed, either by lateness of the season or weakness of the seed after the long voyage and bad winter storage. Still, as Bradford tells, when September came,

. . . and the wellcome time of harvest in which all had their hungrie bellies filled . . . they had all things in good plenty, and besides water foule there was a great store of wild Turkies, of which they took many, besides venison, etc. Besides, they had aboute a peck of meale to a person, or now, since harvest, Indian corne to that proportion which made many afterwards write so largely of their plenty hear to their friends in England which were not faned, but true reports. . . .

The Plymouth colonists had no chartered company in London to send them relays of supplies. Their only friends in the old country were congregations of Separatists who were neither rich, powerful nor in political favor with the Stuarts. From the outset, the colonists were dependent on the crops of their own raising. In Virginia, not once, but half a dozen times, romantic chance intervened to save the settlers from extinction. Help came over the horizon from England, from Bermuda, or, as had happened when Drake saved the Roanoke survivors, from Peru and the Spanish Main. The men of New England had no such inspiring hope. They looked at their heap of golden corn and knew that this was their mainstay.

Too, they entertained no ideas of America as a temporary residence only; a stepping stone to a manor in Kent and a baronetcy. They had come to stay. Accordingly they began in their first year to adapt their ways of living to new patterns imposed by the climate, the soil, the loneliness, the sea at their backs and the savages surrounding them. They were advantaged in this by the fact that they had their women and children with them from the start. They lived in families; not, as the Jamestown settlers had lived for two years and more, like "single men in barracks," a disorderly and disruptive form of existence.

In that first summer the Plymouth colonists built separate houses within the palisade. The center of each house was its

hearth, where fires glowed, where ovens were heated and whisked clean with brushes of corn husks; where loaves of yellow bread were laid to bake until golden brown. Women are naturally curious and given to trying things. Show a woman a new flower, and in an hour she will have thought of a dozen ways of using it to ornament herself, to provide herself with a new perfume or a new condiment. It is not likely that the women of Plymouth once in possession of their own hearths, bake-ovens, mortars and mixing bowls could look at the ears of corn hanging from the low rafters and not devise innumerable new ways of preparing the cereal. From Squanto, and from other Patuxets who hung about the settlement and had a smattering of English words learned from the traders who had touched these coasts before the coming of the Pilgrims, they learned to soak the grains in lye and make hominy. They learned the secrets of suppawn, which was a kind of porridge sweetened with the juice of the crushed green corn stalks; and of succoquatash of corn and beans. Though they drew the line at adding the chopped meat of a young dog, without which, the Indians claimed, the dish lacked its rightful flavor.

But they had weachin pones and griddle cakes, the last an excellent food for journeys, since they could be carried in the pocket or in the tall hat's crown. For how many generations did New England children start for school on winter mornings, glad of the three or four warm "journey cakes" which were to be their lunch? They were buckwheat cakes, baked on a soap-stone griddle over the open fire in a log cabin in Morris County, New Jersey, when the writer's great grandmother and her eight brothers and sisters made ready for school, four miles away. The girls carried their cakes decorously in their hands, using them for muffs as Bronson Alcott's daughters used their apple turnovers. But long-legged Sam fitted his into the crown of his coonskin cap, and then ran, with wildly waving arms, jumping every stone wall between home and the schoolhouse.

The Virginia woods gave richly of raspberries, whortleber-

ries, strawberries, wild cherries and wild apples. In New England, June meant "strawberry bread." August brought blueberry bread, and later cranberry bread, made after the same recipe.

When winter came, and the family gathered about the hearth on which the fire blazed for light and warmth, the men and boys busied themselves with their knives fashioning wooden spoons, bowls and trenchers for the household, the girls wove baskets of reeds, some tight enough to store the shelled corn, others loose for sieves. And while the woman stepped back and forth beside her great carding wheel, watchful of the faces of her own with the firelight on them, and remembering the sea journey and the terror of the First Winter, the wilderness so close and the future so uncertain, it is not unlikely that she would start singing a paraphrase of the 107th Psalm:

*Come now, give thanks unto the Lord,
His graciousness endures alway.
We wandered in the wilderness
Nor found a citie where to stay.
Then cried we to the Lord of Hosts
To save our souls from dark despair
He brought us forth by His right way
Into a land most wondrous fair.*

*The gates of brass He hath broke down,
The iron bars asunder torn,
To thirsty men He gives to drink,
The hungry He doth feed with corne.
The wilderness doth at his Word
Break forth in blossoms brave and gay,
Into the field the sower goes
To scatter seed without delay.*

*Whoso is wise will ponder well,
The loving kindness of our Lord.*

Come, let us now His glory tell,
The power of His mighty Word.
Come, let us praise His mercy true,
That He doth feed us in our need,
The wondrous works that He hath done,
And still our footsteps shall He lead.

That first corn harvest was only a respite before two terrible famine years. These were ushered in by a drought, six weeks long, which caused the new-sprung corn to wither and turn yellow like dried hay. Fear gripped the settlers. What would they do when winter came, without corn in the granaries? The drought affected the Indians' crop even as their own had been blasted. They could not hope to buy corn as they had done during the first winter in New England. Too, the Indians, wise in the way of droughts, were already leaving those parts to hunt and fish in more favorable regions.

From the third week of May to mid-July the colonists looked from their blasted fields to the brazen sky in which no promising cloud appeared, and fought to keep their faith in a God of mercy.

Would rain never come?

Separatists as the men of Plymouth were, many of them had been born in, and all of them had lived within, the teaching of an older faith; one which took account of signs and symbols and seasons, and which paid deference to the supernatural powers of those it accounted saints. It is not likely the Governor could count off the days on his calendar and not remember that July fifteenth had been celebrated in England for centuries as St. Swithin's Day when, if it should rain, the celestial intervention of the medieval Bishop of Winchester would send showers every day for forty days to come. A most useful saint, Swithin, to farmers and gardeners, no less than to the British umbrella-makers.

Perhaps with some faint hope of this sanctified "rain-maker" being within hearing of their invocations and lamentations, the Governor appointed July fifteenth a solemn day of

prayer and humiliation in which all were to confess their sins and to beseech the Almighty to spare their corn.

. . . . For all the morning and the greatest part of the day it was clear weather and very hotte, and not a cloud or any signe of rain to be seen, yet toward evening it begane to overcast, and shortly after to raine, wich shush sweete and gentle showers as gave them cause of rejoyceing and blessing God. It came without either wind or thunder or any violence, and by degrees in that abundance as that the earth was thoroughly wete and soaked therewith. . . . Which did so apparently revive and quicken the decayed corne and other fruits as was wonderful to see. . . .

For the rest of that summer the weather continued with "Shush interchange of faire, warme weather and seasonable showers" that the drooping corn revived miraculously, and yielded a far better harvest than even the most sanguine among the colonists had hoped for. It would have been sufficient to see them safely through the winter, had not the arrival of the Anne a fortnight after the rains began brought a new detachment of settlers for whom the foodstuffs also carried in the Anne were not adequate until another corn harvest twelve months off.

So began those starving months in which five grains of corn were a day's ration for a man. In comparison to the Spaniards, extolled by Peter Martyr, who led a miserable life for five days together with only parched maize to eat, "and that not to saturitie," the Plymouth colonists, "when they had corne, thought it as good as a feast and wanted, not only for five days together, but sometimes two or three months together, and neither had bread nor any kind of corne." It may have been then that Roger Clap bartered a puppy with an Indian for a capful of maize, a trade which gave each party to it a dinner to his liking. Certain it is that during those months the men of Massachusetts became clam diggers, and the women evolved chowders, fries and fritters made of the useful quahaugs. Even this harvest of the sea was not without its

tragedy, for one clammer, too weak from long starvation to run before the advancing tide, was caught in the mud and drowned before his comrades' horrified eyes.

Clams and corn saved Massachusetts, as oysters saved the later colonists on Long Island on more than one occasion. The Dutch had a saying, that "if oysters had legs, Long Islanders would starve."

The Massachusetts settlers starved, but they survived. They drew their wide leather belts tighter about their gaunt frames, and spoke yet more grimly of the providence of God and His benefits to the godly. And when the *Anne*, on which Mr. Winthrop had sailed with beaver to sell in London, and with orders to make arrangements for further supplies to be sent the colony, did not come over the sea's rim, they took their axes, and summoned what strength they had, to fell more trees, to widen their clearings wherein to plant more and yet more corn, "that they might not still thus languish in miserie."

What discontent with the communal principles on which the colony was founded had arisen before this year is not recorded. But as they realized that their existence in the new land depended on their corn crop above all else, and as they struggled to extend the cornfields, the men of Massachusetts declared themselves unqualifiedly against the communal system. A delegation waited on the Governor and Council with request that the article of the charter which made all lands communal and forbade private ownership of land be abolished straightway.

Why should not every man seed and hoe and tend his own cornfield? Why should not every man support himself and his family by his own labors? Why should the strong in body and spirit be broken down to carry the faint-hearted and careless? By following such a plan to its inevitable end, the representatives argued before the Governor, there would be none left to carry on.

The Governor did not yield without much debate and consideration of the merits of communism versus individualism.

The holding of all property in common was a basic tenet of the Separatists' faith and appeared as such in the Plymouth charter. It was this, some felt, which gave them a spiritual advantage over the profit-taking members of the Church of England and the Romanists. It placed them with the disciples who followed Jesus of Nazareth, and with the early Christians.

But, argued the ardent advocates of individualism, neither the disciples nor the early Christians were alone in a desperate wilderness. They dwelt in cities, ringed round with cultivated farmlands, and where men among them with trades like Paul were able to ply their trades and draw their custom from the unenlightened heathen to the benefit of the holy few. Given such circumstances, communism might work, though it was noticeable that even the early Christians had abandoned it. But in a raw, new, lonely country it would not work.

Finally, the Governor and Council struck out that clause of the constitution which decreed against private ownership of land. A parcel of land was apportioned to each family, according to the size of the family, not for inheritance, or for division, but only for their present use.

Bradford leaves us in no doubt as to the results of this step toward individualism:

This had very good success, for it made all hands very industrious, so as much more corne was planted than other waise would have bene by any means the Governor or any other could use, and saved him a great deall of trouble, and gave farr better contents.

The women now wente willingly into the field and tooke their litle-ons with them to set corne, which before would alledge weakness, and inabilities; whom to have compelled would have bene thought great tiranie and oppression. . . .

The experience that was had in this commone course and condition tried sundrie years and that amongst godly and sober men, may well evince the vanities of that conceit of Plato's and other ancients, applauded by some of later times, that the taking away of propertie and bringing in communitie into a comone wealth, would make them happy and flourishing as if they were wiser than God.

For this communitie (so farr as it was) was found to breed much confusion and discontent and retard much imployment that would have been to their benefite and comfote. For the yong-men that were most able and fitte for labour and service did repine that they should spend their time and strength to worke for other men's wives and children, without any recompence.

The strong, or man of parts, had more in devisiion of victails and cloaths than he that was weake and not able to doe a quarter the other could; this was thought injustice. The aged and graver men to be ranked and equalized in labours and victails and cloaths etc. with the meaner and yonger sorte thought it some indignitie and disrespect unto them. And for men's wives to be commanded to doe service for other men as dressing their meate, washing their cloaths, etc. they deemed it a kin of slaverie, neither could many husbands well brooke it.

Upon the poynte all being to have alike, and all to doe alike, they thought themselves in the like condition; and one as good as another, and so, if it did not cut of those relations that God hath set amongst men, yet it did at least much diminish and take of the mutuall respects that should be preserved amongst them. And would have bene worse if they had bene men of another condition.

Let none object that this is men's corruption, and nothing to the course itselfe. I answer, seeing all men have this corruption in them God in his wisdome saw another course fiter for them. . . .

In abandoning the communal system in favor of private ownership of land, Massachusetts was following the example and experience of Virginia, ten years earlier.

But with this notable difference. In Massachusetts the determination to throw it off sprang from the people. In Virginia it was by edict of the new Governor, Sir Thomas Dale, who arrived in May, 1611, to find the settlers playing bowls in the streets of Jamestown during the hours when they should have been planting and hoeing their corn.

Without John Smith's firm direction and enforcement of his rule that "only he who works shall eat," things in Jamestown had come to a pretty pass. The few who worked, approximately one-fifth of the company, were carrying a weighty

burden of shiftless and disorderly members. Moreover, these had already antagonized the Indians who, under Smith's government were the colony's friends and feeders in times of want. It is hard to condone the severity of some of Governor Dale's punishments which included the breaking of offenders on the wheel and nailing a man to a tree through his tongue, but the statistics of the colony presented by such able observers as Henry Spelman and Strachey reveal that prosperity followed immediately on the Governor's establishment of strict law, and his order that the communal system be abandoned. Each man was allotted three acres of land, for which he was under duty to pay a yearly tax of six bushels of corn into the public treasury, which was also the public granary.

Ten years later taxes were being paid in tobacco. The plant which John Rolfe was the first to cultivate in his three-acre lot, and which, even against King James' expressed distaste, had become a salable commodity in London, had already started Virginia on the road to prosperity.

Virginia went tobacco mad. They grew it in the streets of Jamestown and in the cornlands, until the Council took steps to insure the food crop. Tobacco with its quick return in money was worse than the gold fever. Men forgot that they must eat. To remind them, the Council passed a law prohibiting a man from raising more than one thousand tobacco plants. In addition, he was constrained to "raise sufficient corne for his own needs, and a surplus for those not engaged in agricultural labor." Rolfe estimated that an industrious man, whose chief work was farming, could tend "four akers of corne and 1000 plants of tobacco," and that such a planting should yield grain sufficient for five persons; while the sale of the tobacco would buy apparel for two.

Actually, by the records, Richard Brewster with three other men raised in one year two thousand eight hundred pounds of tobacco and one hundred bushels of corn. And three boys, who seem to have organized the first "4H Club," reaped a harvest

of three hundred pounds of tobacco and one hundred and eleven bushels of corn.

The increase in the planting of tobacco naturally raised the price of corn. The price per bushel in 1624 was the highest known. And just as quickly as they had turned to tobacco, the settlers began to extend their cornlands.

The country was growing by leaps and bounds. Growing, more truly, by tons of tobacco and bushels of corn. Tobacco made Virginia. It determined the type of life along the Tidewater rivers and up to the base of the Blue Ridge. It precluded towns in favor of the large plantations, each of which ultimately became a town in itself. It made a prince of each planter along the rivers. Their ships carried tons of fragrant leaves to London, and brought back in return fine china from Lowestoft, silverware and copper, silks, velvets, laces, mirrors, wallpaper for the drawing rooms, and tuns of wine for the cellars. The same ships brought muskets, gunpowder and slips of fruit trees to plant in orchards, and books like that first folio of Shakespeare which had just been published.

But the smoke trade, and all that it brought about, would never have been without the fields of useful corn which waved green leaves and tassels beside the acres of tobacco. Corn fed the indentured servants whose labor made possible the tobacco crop, long before the "twenty negars" which the Dutch brought to and sold in Jamestown in 1619 had increased to form an important part of the population.

At the time that the Plymouth Pilgrims were holding their Solemn Day of Humiliation for the benefit of their corn, the whites in Virginia numbered less than two thousand. All were foreign born, except the babies, the first fruits of those marriages contracted in 1619 when the Company sent out ninety young women and sold them as wives, at prices ranging from one hundred and twenty to one hundred and fifty pounds of tobacco, according to comeliness. But already the settlement extended inland some seventy miles, up the James almost to

the site of Richmond, and along the York. Wooden block-houses were set here and there between the corn and tobacco fields to which the settlers could repair in case of attack by Indians. They had need of such precautions. The Indians who remained in the region were bitterly antagonistic to the whites' advance. In 1623 young Henry Spelman, the author of one of the most valuable records of the colony from 1609 onwards, a friend and "blood brother" of the Powhatan, and who had been for a while Pocahontas' companion, was on a corn-trading expedition, and had gone ashore leaving part of his crew in the pinnace. Indians put out from the bank, but were frightened off by the crew firing a small cannon. Spelman's mates were congratulating themselves on their cleverness when something came hurtling through the air from the river bank, and landed on the deck in a smear of blood. It was Spelman's head.

But even with the constant menace of Indian raids, the plantations bordered the river on either side. The houses were set close to the bank, with gardens running down to the convenient wharves. The houses were wood, of logs and clap-boards; each with its generous outside chimney from which at all seasons and all hours rose a lazy curl of sweet-smelling hickory smoke. In the fireplace below hung the big iron or brass pots, and it was seldom that the warm ashes did not hold one or two "pones" wrapped up in husks, on the chance of a traveler coming by. Those who came had no road but the river. But they beached their canoes or skiffs, and walked confidently over the grass to ask a meal or a night's hospitality. It was corn hospitality; and none of it was overfine.

*For planters' tables, you must know,
Are free for all that come and go.
While pone and milk, with mush well stear'd
In wooden dishes graced the board,
With hominie and cider-pap,
(Which scarce a hungry dog would lap),
Well stuffed with fat from bacon fry'd,
Or with molasses dulcify'd.*

Beyond the owner's house, a row of cabins for the indentured servants runs like an English village street toward the farm buildings. Still there are few blacks; only twenty-two in the entire colony.

In the farmyards are pigs, cows, goats, chickens. Sheep graze the lawns about the house. Oxen draw plows through the fields. This in itself marks a great advance. In 1617 Ralph Hamor sighed for "six or eight plows, now we have steers to draw them." The first land in America to be broken by a share was in Virginia in 1618. There are few horses; nor need of them, for there are few roads. Travel and trade go by the rivers. Away on both sides along the river stretch the tobacco and cornfields. Tobacco is money for taxes and for export. But corn is food. There is a little wheat grown, but not much of that. The lands are still too fertile for wheat growing. And the seed which Argall brought from Canada has proved disappointing. Corn is easier to raise and more trustworthy. Corn yields more per acre with less labor. Corn is ground at home in a great stone mortar, without the difficulty of cartage to a mill.

Besides, these planters who have survived the Starving Time, the Indian raids, and the successive changes of governors and their policies have grown used to the taste of the rough, sweet, yellow bread. Their bodies demand the energy it gives. A man needs energy if he is to push the frontier back and still farther back, and to drive out the redskins. Too, corn yields more than meal for bread and hominy and "spoon meat." There is the sweet syrup in the green stalks. There are the dried husks to stuff mattresses for master and servants too. There are the cobs for lighting fires, and a few of these to be fashioned into pipes for smoking the homegrown tobacco.

It is usual for the newly arrived servants, a rough lot some of these, the scrapings of county jails and pothouses along the Plymouth wharves, to grumble for fine white bread or at least for moist rye loaves. But they learn soon enough that you cannot feed servants on wheat bread, and make a profit on their labor. In a month or two they are as active in the cornfields

and at husking and grinding as the vanishing Indians were. In the fall they go eagerly into the woods to gather hickory nuts. These, pounded shells and all, in a mortar with a little water, make a milky liquid called "pohickory" which lends a fine taste poured over fresh baked pones.

When the servants' time is up, a period of six or seven years, and they have their freedom and rights, they are already corn-planters. They in turn start plantations of corn and tobacco on which other indentured servants labor for them. The oldest planter's house still standing in Virginia is the steep-roofed, dormered, brick home of Adam Thoroughgood overlooking Lynnhaven Bay (the succulence of whose oysters was discovered by George Percy within a month after Jamestown was founded). Adam Thoroughgood, though the brother of two knights, came to the colony an indentured servant. He worked his way to freedom and the possession of this placid estate. The house he built with two end chimneys, symbols of prosperity and prestige, survives. It is perhaps one of the most fitting symbols of the American dream.

Virginia's elegant days cannot be said to begin before the eighteenth century. Even as late as 1705 Berkeley comments: "The bread in gentlemen's houses is generally of wheat, but some rather choose the pone." Pompous Sir William Berkeley, twice Governor, did much to further the luxury era. As early as 1652, he retired to his estate "Greenspring" near Jamestown where he planted an orchard of two thousand apple, pear, peach, quince and apricot trees. There, too, he maintained a stable of seventy-nine horses.

Reviewing the records, it is amazing how swiftly Virginia moved out of pioneer conditions and into luxury. She could not have done this so speedily but for corn. Corn made cheap labor—white first, later black—in the tobacco fields possible. Corn provided exports to New England and the West Indies. Corn fattened and made prolific cattle, hogs and poultry.

It is no wonder that the private cook books which are part

of the heritage of innumerable Southern families contain pages of recipes for the making of corn breads, puddings, chowders, fritters, batter-cakes, all of them evolved in colonial kitchens whose windows looked out across tasseled fields to the lazy river.



V

America Climbs the Cornstalk

SUCH plenteousness as sprang from Tidewater Virginia's alluvial soil never rewarded the men and women of Massachusetts who labored in their sandy fields with wooden or clamshell hoes. A harvest there was, sprung from that extraordinary union of herring and maize; but those who had seen the golden yields of Virginia and of Calvert's Maryland shook their heads and denied New England a future.

The New England character, as this developed through two hundred years, is the harvest of the New England cornfields. Where man could not raise bread without persistent labor, work took on a dignity it never attains in lands that return easy and bumper crops. Bronson Alcott hoeing his corn and turnips, chopping firewood for his shivering family struck William Ellery Channing as the most inspiring object in Massachusetts. But the cast in Channing's eye was an inheritance from a New England ancestry which had never had to grapple with the problems that come from having more than enough.

Where the fields yield only a frugal sufficiency, thrift becomes a prized virtue. Just as the French, by sustaining a large population on an ungracious soil, developed a genius for proportion, utility and the *mot juste*—all of which were also among the glories of an infertile, overcrowded, frequently hungry Greece—the Massachusetts mind was self-trained to clear, abstract thinking, and to express its thought in a lucent, literary style in which is mirrored the sparse, coolly lovely New England landscape.

The doctrine of low living and high thinking which pro-

duced the Concord philosophers, divines and abolitionists who crowned this country during the nineteenth century was the direct fruitage of cornfields which never made possible the lavish expenditure and waste that formed a picturesque background of southern plantation life.

By no stretch of eugenics could Emerson have come out of Virginia, nor Lee from Connecticut.

It is interesting to speculate on the problematical divergence of the New England character had the Pilgrims found there a teemful soil. How long would the stern Separatist creed have held its integrity against the insidious influences of great natural plenty? There were Puritans who settled in Virginia. Alexander Whitaker who preached in Jamestown's wooden church was one. But the difference between the Low Church, fox-hunting, toddy-drinking parsons of the Tidewater parishes and the Higginsons, Mathers, and Edwards who preached Unitarianism and Congregational freedom of conscience from the pulpits of starched, white churches scattered through Massachusetts and Connecticut bears a direct relation to the difference in yield per acre between southern and northern cornlands.

Out of the same meagerly filled harvest baskets came the passionate individualism which illumined New England's religious and social thought. Where the corn shoots twenty feet high into the sun, and every ear yields five hundredfold, the stature of the planter is dwarfed. Man is made more than a little lower than the grain he hoes. This had happened in the Valley of Mexico; it was to happen in the valleys of Tidewater Virginia. But beside the chary corn-hills in the fields north of Point Judith man's stature reached to the stars.

New England never bowed the knee to Coatlicue, or paid the toll exacted by her terrible fecundity. There were no exuberant harvests to reduce man to vassalage. The New England earth was a stepmother; a conscientious, Puritan foster-parent who did her duty justly, but without sentimentality,

and who did no more than her duty. From her unresponsive bosom men turned for love to that other mother, the sea.

The salt tang seasoned New England speech, as the salt herring seasoned New England farmlands. The sea's loneliness turned sea captain's sons to transcendentalism. Experiences of coral islands and fantastic ports made comprehensible to the New England mind the visionary flights of Ezekiel and the Apostle John. Goethe says somewhere that no man walks with impunity under palms. The men of Marblehead and Hingham who had watched "the sun come up like thunder, out o' China cross the bay," brought home to the big, square, quiet houses with their many-paned, shining windows, and handed on to their sons and daughters, something more than teak-wood chests, carved ivory chessmen and rolls of pale-colored Chinese silks. Who can say what heritage was bequeathed to Hawthorne by his father's dying of yellow fever in Surinam and not of God-fearing old age in the four-poster in the north bedroom of the house on Salem's Herbert Street?

In Virginia, tobacco decreed a society of plantations and few towns. As wealth and luxury increased, these remained on the land. The country snubbed the streets. Too, the tobacco's rapid exhaustion of the soil advanced the planters further and further up the rivers away from the coasts. But in New England, where prosperity could not be harvested from the soil, men's thoughts turned to the sea. The building of ships and the sailing of them created a society of small, coast villages; of houses ranged along an elm-shaded street or fronting on a common which provided pasturage for the cows. Behind each house stretched straight backward a deep, narrow "farm-lot," in which the family worked to raise their own food, and no more.

The village street ran down to quiet water. There catboats and dories bobbed on the tide. On tall ways, proud ships took form that would soon sail to Madagascar and Pernambuco. All day the ship-carpenters' hammers rang in the village. All day, and through months and even years there was talk of the

Sarah Ann, and the *Maid of Gloucester*, and whether one had yet made Capetown, and if the other had had luck a-whaling.

There were few men in those coast villages. The sea claimed all but the very old, the crippled and the spiritually unfit. Hardly was a boy big enough to handle a hoe than he was throwing it down to run down to Derby Wharf to welcome home the *Eastern Queen*; to stand shyly on her weather-stained deck; to sniff the pungent odors from the hold crammed with bales of tea and spices, kegs of rum, licorice barks and molasses; and to stare admiringly at his own bearded uncles and cousins who had strutted the Bund of Hong Kong, and knew what it was like to sail clear around the world.

Boys with that call in their ears couldn't stay in the corn-fields. So it was the women and girls who spaded gardens in April, after the herring had run up the brooks to spawn. The women and girls dressed the fields with fish, and planted corn, and hoed it through the summer while the bobolinks teased them from the meadow grass. Women harvested the corn and husked the ears. Not infrequently it was a long-legged girl with Noah Webster's speller in her hand, who rode the bag of corn to the miller.

In these ways the whites were following the pattern of the corn-planters who had preceded them. Roger Williams observed of the Narragansett Indians:

Their women set or plant, weede and hill and gather and barne all the corne and fruites of the field. Their women constantly beat all their corne with hand . . . and take as much paines as any people in the world. The women of the family will commonly raise 2 or 3 heaps of 12, 15, 20 bushells a heap.

Yet sometimes the man himselfe, either out of love to his wife, or care for his children, or being an old man, will help the woman, which by the custome of the country they are not bound to do.

Women's labor decreed corn rather than wheat as the basic food crop. A woman could rival a man in the cornfield where frequent and shallow cultivation is desirable. The corn roots grow close to the surface and are injured by too deep and

too vigorous hoeing. Wheat had to be cut, cradled, threshed and milled. But corn-harvest meant only passing up and down between the rows, pulling the ripened ears into baskets. The ears could be stored as they were and shelled at the housewife's convenience; a good task for little maids sitting round the fire of evenings. And the woman who had no horse or oxen to cart her corn to the miller could get out the wooden mortar, or the samp mill which was one of Salem's first manufactures, and grind her meal in her own kitchen, as her grandmother had done in Plymouth.

So corn made possible the great male exodus to the sea.

It was a servantless society. True, in the later days of Boston's and Portsmouth's magnificence, the merchants kept slaves and sometimes Chinese or Hindu servants. But in the seventeenth century, New England women did their own housework without shame, and with a self-sufficiency that must on occasions have driven husbands to up anchor. In a society which honored work, the wife who combined the offices of mother, nurse, physician, gardener, baker, brewer, miller, cook, laundress, tailor and dairymaid wielded a power far beyond that of any Southern "toast." Gallants might fight duels or pen sonnets for love of the Evelyn Byrds and Mistress Carters. But bronzed seamen humbly took orders from the "Cap'n's wife" who represented her husband when he was on a voyage. Supercargoes turned in their invoices to her, and waited while she ran over their arithmetic. There were widows, like Madam Martha Smith of St. George's Manor, Long Island, who sent out their own whalers and did business in sperm oil with chandlers all over the world. When these energetic women died, the minister usually read aloud the description of a virtuous woman prophesied by King Lemuel's mother to her son, and the mourners nodded to each other, "How true!"

These New England Penelopes whose Ulysseses had sailed away into the sunrise believed in "gumption."

"There's precious little," one of them used to say to her

granddaughter, "you can't set right with gumption, and a few drops of oil."

And usually with more gumption than healing oil, they proceeded to right innumerable conditions which they considered wrong. Ladies' societies dedicated to the improvement of everything from the higher education of the members to the morals of the Patagonians flourished in every New England village and town. Most of the "movements" in America began in some New England parlor, and were nourished through infancy on chicken and clam-pie suppers, sales of bread, pie and johnnycake. New England cornfields, tended by these missionary zealots, sent of their harvest to clothe the innocently naked Hawaiians in nankeen drawers and calico Mother Hubbards, and to build tin chapels on the banks of the Ganges to convert the Hindus to the tenets of Congregationalism.

It was surprising how the tide of New England corn, thriftily administered by women, rolled around and fed the world.

Much of this might be read merely as a quaint chapter of New England's social history were it not for the spread of the New England gospel into the Western Reserve and the states of the corn belt during the years of American expansion following the Revolution.

The migrants carried with them across the Alleghenies the ideal of strong-armed, strong-minded women. That ideal had originated in a civilization in which women had labored with hoes to make the corn to grow. The food of the western frontier was also corn. The women of the frontier were expected to grow, as well as mix and bake, the family bread, while the frontiersmen hewed logs, hunted, trapped, fished. It was a repetition of the life lived in early colonial Massachusetts and Connecticut. So the early New England woman never died; she merely moved west. And she carried with her to her new home, after the way of all women since the days of Rachel, her familiar household gods—the "movements" and the betterment societies, the reverence for education and the right of individual conscience, and the ideal upheld by King Lemuel's

mother of a woman who "looketh well to the ways of her household and eateth not the bread of idleness," and who therefore had the right to demand to be given "of the fruit of her hands; and let her own works praise her in the gates."

One thing that kept New Englanders hustling was the persistent necessity of making the colony pay dividends to the shareholders in England. By 1624, for an investment of £25,000, English capitalists had acquired the whole of New England. They made it clear that they were engaged in a strictly business enterprise. The colony was expected to pay. And pay it did—if sometimes through the long, Yankee nose.

Virginia paid her quit-rents in wheat first, later in tobacco. New England paid hers in fish and furs. To get these she had to have ships and corn, the last for barter. She began building ships before she built houses. In the first September, when the harvest was bared, a party with the useful Squanto for guide sailed in the shallop to trade with the Tarentine Indians and brought back to Plymouth "a good return in furs."

The following year they pushed their trading along the Maine coast and into the Kennebec, from which river they acquired seven hundred pounds of beaver. The trade was invariably in corn. In 1633, when this was rated at six shillings the bushel, beaver sold at:

1 lb. beaver	2 bu. corn
2 lbs. beaver	3 " "
5 lbs. beaver	9 " "

The acumen with which the Yankees bargained and bartered was that of men prodded by threats of destitution. The business done by one enterprising colonist whose original capital was 13 gallons of seed corn reads like a teaser in arithmetic. He sowed his seed, tended the crop and harvested 364 bushels. These he sold on credit to the Indians, receiving in their winter catch of furs, pelts to the value of 18 shillings per bushel of

corn. The beaver shipped to England sold for £327. Not a poor profit to take from thirteen gallons of seed!

The fur-trading posts were the first extensions of the colony. Later came the founding of Lynn and Salem, encouraged by a promise given by the Plymouth settlers that they would supply the newcomers with corn for one year. Intercourse between the settlements was necessarily by boat. Only Indian trails cut the forests. New England had practically no roads, and no horses to travel them before 1650. Endicott, at Salem, lamented that spring freshets and the state of his health made fording streams impossible, preventing his coming posthaste to Boston to argue a point with Governor Winthrop. Ships were an immediate necessity if New England was to grow, and pay its indebtedness.

The speed with which those first fleets were cut from the forest and sent down the ways makes one gasp. They were sizable vessels, too. The *Desire* launched in Marblehead in 1635 weighed 120 tons. Salem made a specialty of large decked shallops, of from twenty to thirty tons. These traded with the new settlements on the Connecticut River and along the Sound and even with Lord Baltimore's *Avalon* in the Newfoundland. Some sailed to Bermuda with cargoes of pork, corn and salt fish, and brought back potatoes, oranges and lemons for the Salem folk to gawk at. On a single day in 1643, five vessels cleared from Boston. Two were of three hundred tons each, one of one hundred and sixty tons. All five had been built in America.

Since there was little currency in the colonies, and that a random collection of English, Dutch and Spanish silver pieces, labor was paid in corn. In 1631, maize was made legal tender for debts, taxes and fines, at a fixed rate of six shillings the bushel. A law prohibited the feeding of this "country pay" to swine, except when a plentiful harvest sent the value of the grain below the six shillings rate. Still later, however, the County Court passed a law that "no one within these liberties

shall refuse to accept Indian corn at 2 s. 6 d. the bushel for any contract, whether of labor or of cattle."

So, in a sense, corn built the ships of New England, as corn filled their holds when they went fur-trading.

The Dutch had taken from ten to fifteen thousand pounds of beaver annually from New England. Dutch ships traded in and out of all the ports of the Atlantic, fetching and carrying every sort of cargo. In the same year that Plymouth was settled, the indomitable Reynier Pauw organized the Company of the West Indies to capture Spain's American possessions, as the East India Company had already appropriated Spanish and Portuguese power in the Orient. The great business empire of the Netherlands was nearing its height. Of Europe's entire fleet of twenty thousand sizable vessels, 16,000 sailed under Dutch command. John Smith had tried to drive home to London merchants the fact that with no products of their own to sell, the Dutch, by making themselves carriers of the world's goods, had become the richest nation on the continent. During the first part of the seventeenth century it seemed as though you could not move anything, anywhere, without a Dutchman's help.

Their settlements on the Hudson were primarily for the purpose of cornering the American beaver trade as they had already captured the Russian fur market. The first ship to sail from New Amsterdam with a cargo carried more than seven thousand beaver skins, and nearly as many otters. In 1656 Andries van der Donck, the patroon of Yonkers, estimated that 80,000 beaver were taken that year from that quarter of the present Westchester County.

It was not likely the mynheers would suffer the competition of the New Englanders without resentment and increased efforts of their own. The traders at Fort Orange and the scouts who went into the St. Lawrence country and to the villages along the Great Lakes held out tempting offers of rum and gunpowder and muskets as against the corn prices paid by the Yankees. After the poor harvest of 1630, when beaver went

up to twenty shillings the pound, Massachusetts passed a law forbidding the sale of breadstuffs to Indians. The redskins replied, "No corn, no beaver," and turned west, over the Mohawk Trail to sell their catch at Fort Orange.

Chiefly to extend opportunities for fur-trading, the English colonists began to plant out frontier posts in western Massachusetts and Connecticut. These formed in time a protective cordon around the coast towns, permitting them to give full attention to the sea. The frontier settlements served as forts against the Indians and the Dutch. They took the brunt of the French attacks, as when Deerfield was burned. They were also depots where furs were collected to be picked up later by the pole-boats. These sharp-pointed, flat-bottomed craft, twenty to thirty feet long, and only three to five feet wide, were poled up the shallow, white-water rivers of New England. The skippers traded salt fish for beaver and otter skins.

Each of the western outposts belonged to a coast town. The settlers could not remove without permission, under penalty of loss of their lands or of imprisonment, if they were not land-holders. Each was a self-sustaining community. It could expect no supplies from the "mother town." The settlers must hunt, trade, and grow their own food. This, naturally enough, was corn.

So grew the river valley towns of western New England, each one ringed by its cornfields. The plain wooden houses clustered close together for protection. The women, left alone in those villages, knew that in between the rows of corn in the fields lurked fierce Mohawks, waiting for long-haired, blond scalp-locks, or for captives who might be worth a ransom in gunpowder and muskets. There were girls who went into the fields to hoe, or to gather green roasting-ears, who vanished as swiftly and as silently as did Kilmeny in the ballad. Some of those girls were never heard of again. Of others, traders brought tales of seeing a pale-faced squaw tending the fire in an Iroquois camp who looked at them strangely, but shook her head when they addressed her in English.

But persistently, indomitably, the colonists pushed their frontier ever farther and farther west. Each ridge of hills was a bastion only until a new supply of colonists arrived. These were urged to climb the ridge and try the next valley. Corn grew in valleys. With corn and venison and partridge, and trout from the amber brown pools, men and women could live. They could raise families, build houses with dignified, even elegant, doorways carved with the pineapples of plenty, and chastely classic churches. They could form townships, and counties and ultimately a commonwealth.

So corn provided infant America with a backbone while it was developing the use of its legs.

America was growing, quite literally, up the cornstalk. Settlers driving their cattle before them, with a sack of corn slung over the cow's back, and their copper and brass pots and kettles and bedding on their own, moved by Indian trails into the unknown. Before them had gone the fur-traders, following the Indians who retreated sullenly before the advancing tide of white immigration. It was the fur-traders who spied out and reported on the fat lands, and who brought back tales of richer and still richer valleys beyond the blue western hills. They told of the Genesee Valley, that garden of the Iroquois, where the corn grew eighteen feet tall, and the corncobs were eighteen inches long, where there were forty villages with granaries that held sixty thousand bushels of corn. The power of the Five Nations was in their corn wealth, as Sir William Johnson well knew. When the granaries were full the redskins were harder to manage, costlier to bribe. It was natural the traders should know of the harvests and act, therefore, in the capacity of spies. Shrewd business sense took them into the wild with their blankets, beads, knives, mirrors, colored cloth and ribbons in the fall of the year when the corn was harvested and the bucks were in an expansive mood.

It would have been all right if these articles had been all they took. But the ever greedier merchants demanded more and more beaver skins to furnish hats for the gentry. And for

their furs the beaver-killers demanded gunpowder and muskets. Everyone knows how the long-barreled rifle grew longer and longer to call for a higher and higher stack of beaver pelts in "equal" trade.

Down the Hudson floated the long, sharp-prowed canoes laden with pelts for Peter Stuyvesant's warehouses in New Amsterdam. Up the lordly river sailed the *sloeps*, rounding Anthony's Nose, tacking across difficult Martilaer's Reach, bringing supplies from Europe, from the West Indies, from Virginia to the docks of the patroons. The stout Van Cortlands, Verplancks, Beekmans, Van Rensselaers had attained their titles by establishing a colony of fifty persons on their grants within six years' time from the granting. They had come to the New World as business men, traders. But the fatness of the valley overcame them. With the hunger of those who had known only the thin farms and cabbage fields of Europe's lowlands, they seized on the acres, cleared them, planted orchards, vineyards, corn and wheat fields. Each patroon engaged in trade with the Indians, buying beaver sometimes for cuttings from apple and peach trees as well as for gee-gaws and corn. He built his own *sloeps*, and sailed them to far ports. He grew his own food and cattle; and he sat on his stoep smoking his long-stemmed pipe of Virginia tobacco in the summer twilights, watching for the evening star over the Dunderberg, well content that he was out of a warring, uncertain Europe.

The Hudson River settlers raised wheat for export and corn for their own use. The mate of the *Half Moon* had reported of the September harvest in those parts:

I saw there a house well constructed of oak bark, and a great quantity of maize or Indian corn and beanes of last year's growth there lay near the house for the purpose of drying, enough to load 3 ships; beside what was growing in the fields.

Not only were the Dutch jealous of the advance of the New Englanders. They also saw their fur trade, which was reported to be worth £10,000 a year, menaced by the Swedes

whom Peter Minuit planted on the Delaware. Minuit, lately expelled from New Amsterdam, was wise in colonizing experience. He chose good crop land for New Sweden, and counseled the settlers not to rely only on the two barrels of wheat and two of rye and barley which they had brought with them for seed.

"Plant Indian corn," he warned them. Only by so doing, he added, could they be assured of sufficient food to carry them through the first year.

But Minuit died on the return voyage to Sweden, and his warning was promptly forgotten in the zeal to make quick, easy profits by trade with the Lenni Lenape and Susquehannocks. The Swedes undersold the Dutch until Governor Kieft in New Amsterdam complained of a loss of 30,000 florins. It took several hard years, when political troubles at home prevented the supply ships from sailing, to make the colonists realize the soundness of Minuit's policy. The cargo brought to Fort Christina by the *Fama* in 1644 would seem to indicate that the settlement had turned its attention to agriculture. It included:

- 3 large saws for Saw Mill
- 8 grindstones
- 1 pr. stones for Hand Hill
- 1 pr. large stones for Grist Mill
- 5 anchors
- 250 copper kettles
- 300 prs. Shoes
- 200 prs. Stockings
- 200 barrels Flour
- 20 barrels Spanish salt
- 10 Hogsheads French wine
- 1 Hogshead Brandy
- 10 gilded flag-pole tops.

Only the last items hint of pompous magnificence on Tinicum Island where Governor Johann Printz was building his mansion surrounded by the finest gardens in the New World.

It may have been from the Swedes that the Lenni Lenape got their peach trees which amazed William Penn. A letter sent to Sweden requesting a minister for the colony described the Delaware colony:

Almost all of us are husbandmen. . . . This country is very rich and fruitful. It produces, God be praised, all sorts of grain; all that we plant and so gives us plentiful returns so that we are richly supplied with meat and drink, and we send out yearly to our neighbors on this continent and neighboring islands bread, grain, flour. . . .

In the early days the flour was chiefly of buckwheat, though Pennsylvania was to become a wheat-growing state and the city of Baltimore the chief flour port in the East. But to the English who were moving into New Jersey from Long Island and Connecticut the Swedes taught the uses of buckwheat flour, and how to combine this with corn meal. What the johnny-cake was to Rhode Island and the pone to the South, the griddle cake, started with Indian meal, was to pioneer New Jersey. A stack of these, very hot and smoking; dark and slightly sour from the buckwheat, slightly gritty from the yellow meal with which the batter is properly started; so thin as to be lacy on the edges; well buttered, and top-dressed with strong, dark buckwheat honey is a meal to stay a man through a long day felling timber in the pine barrens.

With an anxious eye on the Swedes and the Dutch already in possession of two great rivers leading into the fur country and close to the French on the St. Lawrence, King Charles persuaded the first Lord Baltimore to abandon his plan for a colony south of the Virginia Plantation in favor of one on the Chesapeake. The *Ark* and the *Dove*, with the first contingent of Catholic settlers, sailed up the Potomac into the wide bay of St. Mary's River and dropped anchor at the base of a bluff where stood an Indian village. Leonard Calvert bought the land for some steel hatchets, hoes and pieces of colored cloth. By his treaty with the Susquehannocks they were to hold half

the village and till the cornfields until harvest; then remove, leaving the whites one-half of the crop. By this wise arrangement the Marylanders had food and to spare. That first autumn they sent a ship loaded with corn to Massachusetts to trade for salt fish.

The Calverts were noblemen high in favor at the court of the Stuarts, even despite William Claiborne's efforts to discredit their intentions in America. Lord Baltimore's position was that of a feudal baron; he paid to his sovereign during Easter week in token of fealty, two Indian arrows a year. His own rentals from settlers were collected in corn, capons, fat pullets, occasionally a buck's forefoot. The society they founded was simple. It drove its roots deep into the rich soil. Father Andrew White's journal tells how the English women learned gratefully from the squaws how to prepare the Indian corn. And from another observer comes this comment of life in Maryland: "The Son works as well as the Servant, so that before they eat their bread they are commonly taught how to earn it."

All this was quite another mode of life from that which tobacco prosperity was causing to grow along the rivers of Virginia. There, as the plantations spread, the work was done first by indentured white servants. These were divided into two classes. There were those who had sold themselves into servitude to pay for their passage to Virginia; and there were the felons, sent to work out the terms of their sentences and the "kids," shanghaied by unscrupulous "spirits" about the docks of London and Liverpool. These kidnappers did a good business selling bond-servants, male and female, to the ships' captains to be conveyed to the colonies. But toward the end of the seventeenth century this trade fell off as the African slave trade grew. The planters preferred slaves to servants who would attain their freedom just when they had become most valuable.

The blacks who survived the voyage and reached the tobacco and cornfields, increased rapidly in numbers. Negroes were

cheap to own. They lived in ramshackle cabins, wore scraps of clothing and raised their own food. A peck of corn meal a week, often ground by their own hands after the day's work was done, was the usual allowance to a slave. It is probable that under the utmost pressure a Negro could rarely be brought to do as much work as an energetic white man. But the hours of slave labor covered the whole period of daylight; corn-husking and rice-beating were often done before daylight and after dark. There were laws forbidding masters to exact more than fourteen or fifteen hours work in winter, and more than fifteen or sixteen in summer.

A white bond-servant, who had served his term and paid off his bond, could take up land, raise a tobacco crop, use the profits to buy a slave or two, and then capitalize on their labor to increase his acreage and his profits. These freed servants were settling the western counties closer and closer to the strip of forest which separated the plantations from the Blue Ridge. All these were corn-planters. Corn had been the chief food of their bondage.

Those poor Christian servants in Virginia and Maryland and other northerly plantations that have been forced to live wholly on it, do manifestly prove that it is the most nourishing grain for a man to subsist on, without any other victuals.*

By the same progress of wealth from corn to slaves to tobacco to money, the wooden plantation houses along the Rappahannock, the York and the James were being supplanted by brick mansions with curving wings, bedrooms for thirty guests, ballrooms and lordly chimneys. The number of a man's chimneys told his rank; two made a major, four a colonel. There were box gardens and bowling greens, and libraries, like that of Colonel Byrd of Westover which numbered "near 4000 Volumes in all Languages and Faculties." And in more than one paneled hall hung the beauties and gallants of the family painted by Lawrence, Lely, Kneller and Benjamin West.

* Lawson's History of Carolina.

Tobacco paid the taxes, the bills for presentations at court and for educations at Oxford and Cambridge. But it was corn which made tobacco possible. Even in their elegance the southern planters did not forget this. They ate the hot corn-breads which their black cooks learned to prepare, with frank enjoyment of their flavor. The enjoyment was tinged with a devout thankfulness similar to that of the earnest Hebrews in eating their ceremonial, unleavened loaves. Both were truly Passover breads.

By the time the colonies were a century old, a new spirit was moving the men and women who turned their faces to America. These were no longer adventurers, with the gold fever in their veins. Nor were they traders, seeking quick and exorbitant profits. They no longer talked of America as a wilderness, but as a continent of amazingly fertile land, land on which to grow crops. A land in which no man who was willing to work need go hungry. The First Supply to Jamestown had numbered thirty-five "Gentlemen," a great number of "Gentlemen's gentlemen," six tailors and a perfumer. Surely a strangely assorted company to combat the wilderness. Now the ships were bringing a different breed of Englishmen, wearied of long-drawn quarrels between kings and parliament; Germans and Moravians seeking civil and religious liberty; Irish wild geese whose cause and property had been lost on the Boyne Water; and Scotch partisans of the Stuarts. For twenty-four years the armies of Great Britain, France, Austria, Spain and the Netherlands had been marching across Europe from Dunkerque to Vienna, from Gibraltar to Berlin. Marlborough's soldiers had trampled the vineyards along the Rhine and the potato fields of Belgium; Europe's granary along the Danube was ravaged. Men who loved the land were sickened by this turning of it into a dreary battle ground. Standing in their wrecked farms they looked across the Atlantic at a continent that promised peace and bread without scarceness.

Young Philip Carteret, first Governor of New Jersey, walked from the landing stage to the center of his "capital" city of

Elizabethtown which then numbered four families, with a hoe over his shoulder, in token that he, the King's representative, was a farmer among farmers. Symbolically, the Seal of the Twenty-four Proprietors of East Jersey bore the design of a bundle of English wheat flanked by ears of American corn.

The day of the man with the hoe had come.



VI

Tomahawk Rights and Corn Titles

IN THE soft brightness of an early morning in the month of August, 1716, a company of ten periwigged gentlemen stood on the lawn before Governor Spotswood's country house near Fredericksburg, Virginia, while twice as many Negro servants brought up their mounts. Drawn up in the lane were two companies of Virginia Rangers, lanky youths in buckskin breeches, with muskets. Proudly apart, beside a tall cedar, four Indians, naked save for breech-clouts and wampum necklaces, watched the great show of preparations at the house front with curiosity tinged with disdain.

From the steps Lady Spotswood and several other ladies called and waved gay farewells as the gentlemen wheeled their horses down the lane. The Rangers fell into line. After them came a train of pack animals laden with equipment for a fortnight's march. Guided by the four Indians, the party moved out into the highroad. Most travelers leaving that house turned to the east, taking the uneven country road winding between worm-fences down to Williamsburg. These turned west. In a few hours' march they would come to the end of that road. Thereafter there would be only a trail running into the primeval forest. Where that trail might take them no one exactly knew. Perhaps, as they answered children who asked that question, in a squirrel track up a sycamore tree.

To Virginians, Virginia ceased at the "Back Woods," a strip of forest fifty miles deep lying between the open Tidewater valleys and the line of hills that smudged the western horizon. The "Blue Ridge" Virginians called this, appropriately. What lay on the other side of those hills? Would one

who climbed them look down on the fabled Sea of Verrazano which, early map-makers believed, made a deep indentation into the American continent about the fortieth parallel?

John Smith had wondered about this and itched to know the answer. He had taken the shallop up the James to the falls in an effort to reach the river's fall line. But he had never solved the mystery of the Back Woods, or what lay beyond the mountains.

For more than a century Englishmen had held a strip of the Atlantic coast running from the Penobscot to Savannah, but nowhere more than one hundred and fifty miles wide. Fur traders brought tales of great freshwater seas to the north, and of rivers and valleys between ranges of hills in which the Indians grew corn of fabulous height and yield. The French, going by canoe from the St. Lawrence, had discovered the Ohio and the Mississippi. But how near, or how far, these rivers were from Virginia, or what sort of land lay between it and them, no one knew. As for what lay beyond the Mississippi . . .

It might well be, averred several of those periwigged riders in attendance on Sir Alexander Spotswood, that China was a great deal closer to Virginia than some of them suspected.

The Governor's expedition up the mountain wall and through Swift Run Gap, whence he looked down into the Great Valley, is one of the turning points in American history. By it this country emerged from infancy and entered upon its adolescence. No more could Virginia be said to end at the Back Woods. No more would Virginians be content with the Tidewater. Eyes that had looked on the Great Valley drowsing under the August sun, with the silvery Shenandoah threading the woodlands and the Indians' cornfields, would never again be satisfied with the known lands.

Beginning in the eastern edge of the Alleghenies in southeastern Pennsylvania, the Great Valley runs in a trough through western Maryland then widens into a gracious vale between sheltering mountain walls. This traverses the width

of Virginia and drops through a series of water gaps into the Carolinas.

Americans were not slow to realize and seize on the wealth of that fertile, limestone soil. The Tidewater planters appropriated large tracts on agreement to place settlers there. Governor Spotswood carved out a generous slice for himself and his heirs—one of them was to be the beloved second wife of Patrick Henry. His first wife brought him three hundred acres of pine slashes; by his second marriage he entered on miles of rich valley land. Sir John Randolph took some 118,000 acres and Lord Fairfax added 6,000,000 acres of the northern end of the vale to his Virginia holdings.

Fulfilling their agreement, these gentlemen offered acreage in tracts of various sizes up to one thousand acres. They did not wait long for takers. There were many small planters in Virginia, whose lands had been exhausted by the voracious tobacco, who welcomed a chance to move onto new and richer upland soil. So the parents of George Rogers Clark left the Tidewater for the Piedmont. So came the Jeffersons. So came younger sons and cousins and sons-in-law of the Byrds and Carters and Lees and Randolphs.

New arrivals from Europe, learning of the Shenandoah, bought claims, sight unseen, bought pack-horses and cattle in Williamsburg and moved up the rivers to the hills. Even in London, word went round that the Plantation in Virginia had entered on a new era of prosperity. People went "new land mad" as they called it, and the ships sailing westward were jammed with emigrants.

Other settlers came from the north. It is said that the first white man to overlook the Shenandoah after Lord Spotswood's Knights of the Golden Horseshoe returned to the Tidewater, was the Dutch fur trader, John Van Meter. Competing against Colonel Byrd's trade caravans to the Cherokees, he had gone afoot into the Back Woods country and wandered through a gap in the hills into the Shenandoah. Van Meter returned to New York and called his sons together. He told

them that he had discovered "the best land I ever saw anywhere." He and they sold their stock in trade, bought corn and cattle and turned south to claim 40,000 acres of the Great Valley. As the rumor spread, it seemed as though a land hunger seized on colonists up and down the coast. Men resorted to all manner of ruses to get more and more valley land. Jacob Stover hit on the plan of baptizing his cattle and entering their names as prospective settlers in order to widen his own holdings. And there was a bold young woman who dressed in male attire and presented herself several times over to fill applications for tracts in the Great Valley.

The great tide of migration began soon after 1730 and continued up to the revolutionary period. It seemed as though all America was on the move. Lord Dunmore wrote home:

. . . the established authority of any government in America and the policy of Government at home are both insufficient to restrain the Americans. . . . They do and will remove as their avidity and restlessness make them. . . . Wandering about seems engrafted in their nature. They do not consider that Government has any right to forbid their taking possession of a vast tract of new country.

There were Massachusetts men, like the blacksmith Mordecai Lincoln who sold his forge and his grist mill near Hingham, where his forbears had settled about 1640, to take up land in the new colony of New Jersey. Forty years later his son, "Virginia John," sold his three hundred acres of Jersey cornlands to take the trail down into the Great Valley. He settled himself and his five sons on holdings in and around Rockingham County. Fifteen years later his son Abraham followed Daniel Boone over the Wilderness Trace that went past his farm into Kentucky. There he blazed his name, the date and an acreage on a tree establishing tomahawk rights to some seventeen hundred acres. There, hoeing the corn that would give him "corn title" to the land, he was killed by a Cherokee's bullet. His sons who saw him fall took up his musket, his axe and his hoe and held the land. One of those

sons, Tom Lincoln, taught his son Abraham to hoe corn on those very lands that were truly a "dark and bloody ground." Of that farm on Knob Creek, Lincoln said long afterward:

I remember that old home very well. Our farm was composed of three fields. It lay in the valley surrounded by high hills and deep gorges. Sometimes when there came a big rain in the hills the water would come down through the gorges and spread all over the farm. The last thing that I remember of doing there was one Saturday afternoon, the other boys planted the corn in what we called the big field, it contained seven acres—and I dropped the pumpkin seed. I dropped two seeds every other hill and every other row. The next Sunday morning there came a big rain in the hills; it did not rain a drop in the valley, but the water coming down through the gorges washed ground, corn, pumpkin seeds and all clear off the ground.

In 1816 the Lincolns left Kentucky for Indiana. Folks were moving into the Ohio Valley and into lands sloping to it, as seventy years earlier they had pushed into the Great Valley. Once again the words "new land" had gone forth. Once again there was the promise of taller corn at the end of a westward trail. Fifteen years the Lincolns stayed in the cabin on Little Pigeon Creek while Abraham grew to a lanky manhood. All that time other pioneers were passing their farm going farther west, into Illinois and into the wilderness around the headwaters of the Missouri.

"They say the land out there's the richest there is in this country. . . . They say out there you can't keep the corn from growing twenty feet high. . . . Here folks and cattle have the milk-sick. But out there . . ."

Tom Lincoln couldn't stand it any longer. Hadn't the Lincolns always followed that call to new and richer cornlands? So they bundled the household goods on a wagon, Abraham climbed atop and took the reins. He pulled his wagon into line with a caravan heading for Illinois. Where was Illinois? None of them knew, exactly. It was on ahead, that was enough. And it was new land, and rich for corn.

The pilgrimage which began in a little English village in the first half of the seventeenth century, which went from there to Massachusetts, to New Jersey, to Virginia, to Kentucky, to Indiana, went on to the new country nearer to the Mississippi. The place they chose to stop there was Sangamon, meaning "the land where there is plenty to eat."

The saga of the Lincolns was repeated by scores of other families in that restless eighteenth century. All these took advantage of the unwritten law of the frontier which permitted a man to blaze his name, the date and a number of acres on a tree in the wilderness establishing thereby a "tomahawk right" to the land. When he had cleared a piece and sown a crop on it, he held "corn title." There was not a court in the colonies that would have decided against the legality of such a claim.

Not only were Americans of several generations on the move, the colonies were drawing an increasing immigration from Europe. Most of these came to Penn's Quaker Colony. There were Germans and Moravians from the Palatinate, and Presbyterians from the plantations of Scotch lowlanders whom the Stuarts had encouraged to remove to northern Ireland. These two racial streams poured into Philadelphia and took the road west. A traveler of the time describes meeting them on the trails in the early Spring, while the snow still lingered on the eastern slopes.

A man driving a cow or two; perhaps leading a pig by a "sugan" of twisted straw, as he had gone many times to the fair in Antrim. . . . Three packhorses moving slowly under unwieldy loads: on the first a woman nursing a baby under her fawny shawl, and with her cooking pots tied to her saddle; on the second a sack of corn and the farm tools; on the third, wooden creels, one packed with bedding and clothing and in the other, two small children, like pigeons in a crate . . .

For forty years and more the tide of Americans, Germans,

Moravians and Ulster folk who were to cut their mark deep into the whole Back Woods region, flowed on, drawn by the promise of new land. A thousand acres of fertile soil to a family. The canny Scots knew that for a bargain.

So they took the trail from Pennsylvania into the Cumberland Valley. There some turned west over Pack-Horse Ford, near Shepherdstown. The first white settler in West Virginia was Morgan Morgan who built his log house at Mill Creek in the present Berkeley County. There he lived like a Gaelic chief, taking his tribute in corn from the sacks later comers brought to his mill to be ground, and settling his children and grandchildren in the coves of the hills for miles around. Scotch-Irish fur traders had crossed over Braddock's Road and reached the Ohio years before the French and Indian wars. They had paddled down the river bargaining with the redskins, and amazed at the country that unrolled richly before them as they rounded each river bend. They had felt out the valleys of the Youghiogeny and the Kanawha; they had started a town of their own at the meeting of the waters of the Allegheny and the Monongahela.

Maine and Massachusetts thought of the expansion of the colonies in terms of ships, trade with Surinam and China. But the men of the middle colonies knew that the country must grow westward, away from the coast, away from Europe. This was possible because every trader brought back word of a plenitude of wild game and fish, and of Indian villages surrounded by liberal cornfields. Where the corn flourished Americans could live. Benjamin Franklin wrote enthusiastically of planting two new colonies between the Ohio and Lake Erie. He lamented that the glory of founding settlements in that rich country would, in all probability, not fall to him. Meanwhile, in Virginia, the Ohio Company was formed and purchased from the Crown two hundred million acres along the river between the Monongahela and the Kaskaskia.

Not all the new settlers and restless ones turned to the

Ohio country. The majority kept on southward until they entered the gracious vale of the Shenandoah. It was the first time the movement of white settlers had been north and south, not from east to west. So Joist Hite, with fifteen families, chopped a way from York, Pennsylvania, to Winchester. So Daniel Boone's father and his eighteen-year-old son went from their farm on the Schuylkill down the Great Valley into backwoods Virginia. So the Lincolns went. There, in the Valley, they swung their axes and cut logs for cabins, roofing these with bark or slabs of limestone. There they girdled trees and burned underbrush to clear fields for their first crop of corn. The wood ashes further enriched the soil. Dr. John Mitchell, traveling in Virginia in 1767, commented, "the woodlands are to a planter in North America what a dunghill is to a farmer in Britain." And with the shoulder blade of a deer they hoed their corn hills, as the Iroquois did.

These men entered the Valley arrogantly. When demanded to tell by what right they squatted, they replied, "It was against the laws of God and nature that so much good land should be idle while so many Christians wanted it to work on and to raise bread."

These Scotch-Irish pioneers left a deeper mark on the Valley than did the noble lords Spotswood, Randolph and Fairfax. Throughout a century they and their descendants gradually overspread the whole Appalachian highlands. Not content with the Virginia Back Woods, they ran down into the Carolina Piedmont where Carolina offered land at cheaper rates than any in Virginia. They pushed southwestward over the Warriors Path, later to be known as the Wilderness Road, into the dark and bloody ground of Kentucky.

Their faith was in the new land. Richard Henderson employed Boone to map Transylvania beyond the mountains. He counted on Boone, who had the Indians' respect, to make the bargain he knew he, himself, could not make. For twenty million acres they paid the Cherokees £10,000 in blankets,

gee-gaws and firearms. It was thought an exorbitantly generous price at the time. And so it was, compared to what Calvert gave for Maryland, or Peter Minuit paid for Manhattan Island. But Henderson believed that land which would grow corn and tobacco that could be floated down the Mississippi to be sold in New Orleans was worth that price ten times over. History proved he was right.

James Robertson and John Sevier who pushed the frontier on to the Watauga River in Tennessee were mountain-bred men. They, too, dreamed of an agricultural colony there and cleared lands for corn on all sides of their blockhouse. All the backwoodsmen were more interested in blazing new trails westward to new farming lands than in riding the traveled roads eastward to the sea. In the highlands they created a new type of American, distinct from the New Englander and from the Tidewater planter. This was the Backwoodsman; the tall, lank, quiet man in buckskins and coonskin cap; the first American to cut his ties with Europe completely; the first American to look westward for tomorrow.

These men measured their boyish growth against a hoe handle in their fathers' cornfields. They had put in hours at the tin gritter, grating corn from the cobs. They were raised on corn dodgers, with wheat cakes to mark Sundays on the family calendar. They had made pones and baked them in the ashes of campfires on lonely trails. They had hastened their steps coming home at dusk, axe on shoulder, knowing there would be Brunswick stew and hot cracklin' bread waiting for them on the hearth. Most of them had made corn whiskey in stills patterned after those stewing in every bog in Ireland. The glass bottles molded like miniature log cabins in honor of William Henry Harrison during the campaign of 1840 were filled with "corn" to remind Whig voters that their candidate represented the men and the ideals of the Back Woods. The log cabin was not American, but Swedish. The first of these were built by Peter Minuit's Swedes on the Delaware. But the vigor of the backwoodsmen who adopted this

form of house made it the universal symbol of early American life.

Sturdy of body and tersely picturesque of speech, these men poured into the American language a striking metaphor, Gaelic in its penetration to essentials, but making use of homely and roadside terms, as the frontiersman utilizes for his need whatever lies close to hand. Lincoln's tongue was taught them. The oratory of Clay and Calhoun sprang from the same mountain source. From it, too, flowed the powerful clarity of John Marshall's mind.

All these men felt the pulse of the country beating under the ground they hoed. With corn, and with the strength and energy it gave to them, they opened the west. Not only that, but they forced the west on a reluctant east. New England and Philadelphia could protest spending fifteen millions of dollars for Louisiana; the backwoodsmen had delivered their ultimatum: make the Mississippi an American road for American tobacco, corn, pork, lard and lumber to go to an American market, or we will secede. "We will take on Spain with one hand, and lick the eastern states with the other."

Once over the mountains these backwoodsmen spread along the river valleys of the midwest. Strengthened by the fatness of that land they influenced political affairs in this country for several generations. Through the first half of the last century one heard in Congress the language of the American Back Woods. The Adams family might shrink from its colloquialism; but what Yankee satirist has outdone Charles Sumner's retort to his detractors: "These gentlemen criticize me for lack of that in which the billy-goat is their equal, and the wild ass their superior."

The spirit of the backwoodsmen was symbolized in our time by Sergeant Alvin Yorke whose capture, single-handed, of 132 German prisoners, was characterized by Marshal Foch as "the greatest thing accomplished by any private soldier of all the armies of Europe." Alvin Yorke was born in a cabin made out of a corn crib. When his parents married, they

chinked the holes in the crib with clay, put in a puncheon floor, cut a window, added a chimney and set up housekeeping.

One great service to the colonies rendered by these backwoodsmen cannot be overestimated. During the French and Indian wars they formed a line of defense stretching from Pittsburgh down the mountains to Kentucky. The Tidewater planters, who had offered tracts of valley land at low rates, were not unaware of the possibility of such a service being needed.

France had been pushing down the Mississippi from the Great Lakes while at the same time she extended her colonies up the river from New Orleans. John Law's scheme for replenishing France's national treasury had provided Europe with its greatest bull market since the tulip craze. All sorts of people, wig-makers and cooks, small-town notaries and army captains, gambled in Louisiana shares on the basis of John Law's advertisements that the Mississippi Valley offered a wealth of food and gold to be made from foodstuffs. Rumors of the prodigious yield of the Louisiana maize ran through France. It was the old story of the Seven Cities of Cibola all over again.

Le Page du Pratz, who came to Louisiana in 1710 before the bubble burst, tells of a shipload of eight hundred eager Frenchmen, drawn by the promise of fertile land, arriving in New Orleans and staring in consternation at the tangled forests of liveoaks, the alligator swamps and the painted Cherokees. Meanwhile, slave ships brought cargoes of blacks from the Congo to work in the rice fields and indigo plantations. The Frenchmen soon found a value for the small, white "homony corn," which ripened quickly and gave two crops a year. The Negroes grinned at sight of it. Corn was the first familiar thing the poor creatures found in the land of their bondage. Their tribes had grown it in West Africa since the Portuguese first took it there in the early sixteenth century. They pounded the kernels in a mortar to a paste which they called "cooscoosh."

Many a disheartened Frenchman dined on cooscoosh moistened with opossum broth and seasoned with salt and *fines herbes*, and counted this the least of his troubles in Louisiana.

Later the French laid hold of the rich lands along the Wabash and Kaskaskia, the American Bottom. In a strip along the Mississippi three to seven miles wide, and about one hundred miles long they planted orchards of fruit trees, wheat and corn. They floated tons of flour, bacon, corned pork, hams from bears and hogs, and myrtle wax down to New Orleans on flat-boats, or in pirogues made of hollowed-out trees. The trip down-river took a fortnight, what with keeping the boat from running onto floating roots and shoals. From Indian villages along the route the savages stared at the voyagers. Often arrows, later musket balls, shot from a thicket on the shore. Two weeks to float down to the Gulf; three months to row the boat up-river, even with twenty men at the oars. No wonder the French thought of the Illinois country as a granary for Louisiana, but with no future possibilities of its own. The English concurred in this. "The trade will go with the stream," General Gage reported to Lord Shelburne in 1767.

The country between the fall line and the Mississippi was a battleground between settlers and Indians for a century. The Shawnee chief Keigh-tugh-qua—the name means "Young Blade of the Maize"—had taken toll of the advancing settlements before the battle at Point Pleasant after which "Cornstalk" offered the colonists lasting peace. He and his Shawnees retired to the plains of the Scioto. In 1777, true to his word, Cornstalk appeared at the colonists' forts with warning that the British were urging the Shawnees to attack the American settlements. He gave himself and his son as hostages. He paid for his honor with both their lives when the killing of a white man by an Indian drove the settlers to revenge.

With first the French and later the British inciting the Indians of the Mississippi Valley against the colonists, the backwoodsmen in the mountains and along the river valleys assumed an importance to the Tidewater planters. How many

families of them were wiped out in those years of stealthy, bloody raids no one will ever know. Later comers into the mountains often found tracts of second growth timber amid the virgin forest growth, and in the center of these the charred ruins of a cabin. Wild grape vines overhung the standing stone chimney; a vixen and her cubs curled in the deserted oven.

But even in those blood-stained years, the movement westward over the mountains went on. The road which ran down through the Great Valley had, apparently, no ending. Men slipped off clerks' stools, from behind counters and schoolmasters' desks to take the road to the open. Americans wanted land. They wanted the feel of it under their feet; and they wanted that land to be their own. Their corn-titles gave them the freedom of a self-sufficient individualism. That, they dimly felt, was what it meant to be American.

This feeling which runs through the whole body of American thought derives directly from the American corn. Because he had a grain which yielded so bountifully that a small, transportable quantity would provide a crop for a man, his family and his cattle, a grain which one man working single-handed, or even a woman alone, could sow, dress, harvest and mill, a grain which thrived on new land in which the tree stumps still stood, the men of the American frontier were free of the bondage to the soil as wheat-, rye- and barley-growers could never be. The corn-grower had no need of neighbors to help him cradle and thresh. His crop did not compel him to harvest it all at a particular moment, under threat of losing it. He was not even dependent on millstones and miller. He could go forth into the wilderness alone, with his sack of seed corn, secure in the knowledge that he would not starve.

This sense of security and independence from others separates the American from the European. Even though the intense industrialization of this country during the last half-century has undermined our sense of inner freedom while filling our hands with sewing machines, electric devices and auto-

mobiles, all advertised to create freedom for us, the American unconscious is less burdened with fear than is the unconscious of any other nation of people. Americans of many generations on the land carry with them and act from a deep if unconscious conviction that no matter what goes on in Washington, in Wall Street or in Hollywood, no matter what happens to the banks, the railroad and the utilities, so long as the land remains, they will manage to make out, in one way or another. Though they do not put this in so many words, they are pinning their faith to the cornstalk.



VII

The Mississippi Flows Through Corn Land

IN MASSACHUSETTS, Samuel Adams' pen scratched on, covering sheet after sheet of paper. Letters, letters, letters. . . . "Support the Non-Importation Act. . . ." "Elect a Committee of Safety and Inspection. . . ."

On the wharves of Boston, Salem and Newport, shipowners and captains gathered in knots and cursed the British revenue officers. The rum, molasses and slave trade brought £40,000 annually into Newport. Yet Britain threatened this by duties on sugar and molasses. In the West Indies the planters' needs kept British workmen constantly employed. It was estimated that for every Englishman in the sugar islands, four pairs of hands in Great Britain labored, wove and spun. But the islands depended on the American colonies for their food supplies. Without American flour, pork, lard, dairy products and oxen for the sugar plantations, the whites there would starve. In the face of this, a British tax on island goods imported into the American colonies, and a cordon of British revenue men armed with writs to enter warehouses, stores and private cellars in search of smuggled goods were affronts not lightly to be borne.

On the steps of county courthouses and crossroads stores in Virginia, tobacco growers gathered to grumble about prices and the restrictions of the Navigation Act.

Taxes . . . taxes . . . taxes . . .

Was the Government in league with Big Business in the form of the East India Company and the Hudson Bay Com-

pany, and against its own citizens, that it handed over the tea trade to one, and for the benefit of the other decreed that British colonists should not spread westward beyond the Back Woods and the rivers' fall line? Did Parliament think to keep the good land beyond the Alleghenies and running to the French frontier on the Mississippi for a fur preserve, prohibiting American farmers from settling on it? And what did King George mean by granting to Quebec the territory from Lake Erie to the Ohio River?

Meetings in Boston, in Philadelphia, in New York; meetings in Williamsburg and Richmond. Patrick Henry thumping his clenched fist on the railing of the church pew, "If this be treason . . ." Farmer George Washington riding over to Gunston Hall to talk gravely with his friend and fellow farmer, George Mason: "Think you, sir, it will come to war?"

Israel Putnam, plowing his Connecticut cornfield with a musket slung from his shoulder, stopping in the furrow at sound of a horse's galloping hooves on the hard road beyond the stone wall: "The British are marching on Boston. The militia is called out. Follow as fast as you can."

Old Put, unharnessing the horse, leaving his plow there in the field to follow that call to Bunker Hill and a major-generalship.

And in Dedham, Massachusetts, Mary Draper heating the deep ovens in her kitchen chimney; kneading dough in a great wooden trough—two parts corn, one part wheat and rye flours—shaping the loaves and laying them carefully on the hot bricks. And while the sweet smell of their baking filled the house, standing at the kitchen door, shading her eyes to look down the road that wound to Concord and Lexington.

Soon there would be farmers coming back along that road, farmers with blood-stained scythes and with muskets in place of the hay-rakes they threw down when the call for the militia came. And Mary Draper, standing at her gate, cutting off generous slices of fresh-baked bread:

"Here, eat this. You're hungry, ain't you? You can't fight the

red-coats if you're hungry. There's cider in that jug. Drink it down, man." Running back to the kitchen to mix and knead and bake more loaves. And still more.

Not that the Revolution was popular. It wasn't. Even the Continental Congress found it impossible to be of one mind about it. According to John Adams, "Every important step was opposed, and carried by bare majorities." In the discussion the delegates from New York, New Jersey, Pennsylvania, Maryland, Delaware and South Carolina stood against revolution. Finally, all but the New York representatives yielded, and the resolution was passed.

The Yankee merchants and mechanics were for the war. So were the Southern planters, and the mountain men who knew that the valleys of the Yadkin, Ohio, Kentucky and Wabash Rivers were good for corn. Was all that territory to be kept a wilderness in order to supply King George and his Whig ministers with beaver hats? But the ordinary run of country people were slow to interest in the struggle. The tracts of a Tory propagandist who signed himself A. W. Farmer were widely circulated and widely commented on. Their obvious intention was to make the farmers in the middle colonies, already disinclined to war, mistrust the policies of the Committee of Sixty. In Hall's *New York Journal*, under date of Thursday, December 22, 1774, appears a letter:

To the City and Country Inhabitants of New York, Friends and Fellow Mortals,

The division between Britain and her colonies is very alarming, but what I think would be more alarming, is a division between the inhabitants of the colonies, the effect of which we have from holy writ, that a house divided against itself cannot stand.

I have seen a pamphlet published by Mr. Rivington entitled the *Country Farmer* which seems to be calculated to throw all into confusion, and to no other end; and artfully to gain his point as a Farmer, he addresses himself to the Farmers and their wives; he tells the latter they cannot treat a neighbor with a dish of tea; and that will be a dreadful thing indeed. To the former he saith

their produce will rot on their hands and they cannot pay their weaver, etc.

Being a Weaver myself, and tho they be generally poor, still they are as useful a set of men as any in the world, and so will remain as long as from the King to the peasant all are born naked, I therefore would beg leave to say a word in answer to our pretended Farmer, and make no doubt but the lowness of stile I shall speak in will be excused when it is considered that a man may be a profound weaver, and no grammarian. . . .

My first answer to our Farmer is that we weavers, and I believe I may say most of the other trades too, cannot live without meat, bread and clothing, all of which I shall gladly take in exchange for my labour. . . .”

Our “profound Weaver” was not the only tradesman who found it no hardship to return to the “country pay” of earlier colonial days. As the war dragged on, a reappraisal of values took place in which the cities lost caste. Land which would produce food became more desirable than a fine house on Broadway or on Boston Common. There was an exodus from New York into the country. All through the northern colonies men who had begun to think of leaving the farms for work in the new factories gave up the idea, and went back to their plows. Food was food. Also it had value in barter, if money was tight. And with the quartermasters of two armies buying rations there was no need to worry about markets for corn, potatoes or pork. The Pennsylvania farmers were selling produce at good prices to the British in Philadelphia while Washington and his men were starving at Valley Forge.

The continuous difficulty which Washington and his generals found themselves in, keeping a force of thirty to forty thousand privates under arms, was not due to lack of courage on the part of the soldiery. It had its roots in the intense sectionalism which made men unable to see the conflict as anything more than a series of local skirmishes. When the zone of fighting moved from one colony to another, many in the ranks saw no necessity for pursuing the enemy beyond

their own territorial boundaries. They preferred to go home and till their fields. "Summer soldiers," Tom Paine called them bitterly, as he poulticed his frostbitten feet with snow at Valley Forge. One reason for this was that the colonists enlisted men for short periods of service, with land bounties for those terms. After Trenton, Washington offered his men ten dollars apiece if they would stay with him a month longer. The Congress advertised a bounty of fifty acres to every deserter from the British Army. Privates in the continental ranks who stayed under arms till the peace were to receive a bonus of one hundred acres. Colonels were offered one thousand acres. Fully one-seventh of the public land was so settled.

At the close of the Revolution New England was feeling acutely the need for more, and more fertile, soil. A newspaper article published in 1787 describes the plight of the New England farmer who had

one miserable team, a paltry plow, three acres of Indian corn, as many acres of half-starved English grain from a half-cultivated soil. With a spot of potatoes, and a yard or two of turnips these complete the round of his tillage.

In 1790 New York State had no settlements west of the Hudson Valley. But the men of Massachusetts and New Hampshire who had followed Sullivan on his raid on the Six Nations brought home tales of miles of cornfields standing eighteen feet high, and of tons of garnered grain to which they had set the torch. One soldier returned to Plymouth with a pocketful of corn of a variety strange to the white farmers. The seed yielded roasting ears with larger, fuller and sweeter grains than those of the immature cobs which heretofore had satisfied Americans as a summer vegetable. This was the first sweet corn. Not inappropriately, it entered our gardens by way of the very fields which Squanto showed the Pilgrims how to sow and dress.

New Englanders cut the first road over the Berkshires into York State by which to move from their depleted farms onto

the rich, rockless land of the Mohawk and Genesee Valleys.

Even the terrible winter of 1788-89 when corn sold in Albany at prices beyond what anyone had known, when two hundred families living near James Fenimore Cooper's father had no bread, when the poor tore the wild leeks from the fields and ate them, did not discourage the land-seekers. York State had another famine, in the Freezing Year, five years later. Then two young men in Albany died of doing what many are reported to have done, pulling the green, growing rye from the fields to fill their empty bellies. Still people could not believe the Genesee Valley could return anything but plenty.

But when the Freezing Year of 1816, which brought a frost every month, killed the harvest, the cry went up:

It's killed the potatoes, the wheat in milk,

Now it's frozen the corn in the silk.

Damn the Genesee Country!

Men packed up their tools and household goods, climbed into wagons and moved farther west into the Ohio country which Franklin had longed to see colonized.

It is significant that even the most disappointed did not turn back to the humming little mill towns. They went on seeking kinder climate and more and more generous soil. In his historic letters to Arthur Young, Washington attributes his countrymen's zest for land and the consequent rise in land values to confidence in the American form of government, and to faith in the country's future and permanent prosperity.

Land promoters were everywhere with scores of schemes. Tench Coxe, of Philadelphia, who served as Assistant Secretary of the Treasury in 1792, planned a settlement on the upper waters of the Susquehanna, either in York State or Pennsylvania. The company advertised rich farmland at fifteen dollars an acre, lying along the river, which offered a route to the Baltimore flour market.

Rufus Putnam, cousin to "Old Put," who had scandalized the Bostonians by leading his troops through their city in shirt

sleeves, and a hat sunburned by long service in the cornfield, and the Reverend Manesseh Cutler, like Moses and Aaron, prepared to lead their brethren out of bondage to a stony soil into a land of fruitful promise along the Ohio.

Interest in the Ohio Valley was stirring in the country for twenty years before the outbreak of the Revolution. Washington came back from his campaign against the French forts to report the amazing fertility of the lands beyond the mountains. A company was organized to explore the river valleys and start settlements. Christopher Gist, who had led Washington down the Ohio, was directed to locate a large tract of fertile land. He paddled down the Ohio to the Kentucky bluegrass country. Then, leaving his canoe, he struck eastward through central Kentucky, over the mountains into Giles County, Virginia, and down Lucky Creek. From farm to farm he went, stopping in country stores and at courthouses, spreading the news of his find. The seven years of warfare had only held back for a brief space the inevitable movement westward.

The one hundred million acres of the Western Reserve drew some of the most vigorous blood from New England's veins. There is scarcely a colonial family that was not represented on the Ohio frontier. Many who had served in the Revolution took land grants in lieu of pay. The Mound Cemetery at Marietta, which was the first capital of Ohio, holds the bodies of more Revolutionary officers than any other acre of soil in the nation. On the headstones one reads the New England names of Putnams, Danas, Cushings, Shaws, Cutlers, Nyes, Buells.

All these crossed the Alleghenies to plant corn.

A generation earlier the young men of those families sought their fortunes on the sea. In New England, farming meant continuous hard work for a mere frugal existence. It meant unequal chances against poor soil, drought, frost and blizzards. There it had become the custom for the family numskull to remain on the farm while his heartier brothers, who had more of that prized New England quality of gumption, turned for

success to the sea. To New England youth the sea was the frontier. It offered a man the hazards and the rewards of desperate adventure.

But in the quarter-century since Washington had floated down the Ohio from Pittsburgh and had seen the finest corn-growing land anywhere in the colonies, a new frontier had been opened to the youth of New England; as Kentucky and Tennessee held out adventure and fortune to the young men from the southern counties.

Several hundred acres on the Muskingum River put into corn and groves of sugar maples would make a man rich in a few years. Corn and maple sugar could be rafted down to New Orleans and sold for cash with which to buy more acres from the Ohio Land Company. Farther west stretched a wilderness where furs could be traded for and timber could be cut. And always there was the mighty river running down to the Gulf where the ships waited to buy cargoes to sell again all over the world.

Out in that new country land meant wealth; as in Boston and Newburyport ships meant wealth. And wealth, wherever a man had it, was power.

So the young men of New England turned away from the mother and lover who had called their fathers and grandsires, to a new frontier in the west.

It would seem that there is something in the American temperament which ever and again makes the youth of this continent seek contact with the frontier. Always that contact has had the effect of quickening the American spirit. The movement away from the coasts into the Great Valley re-lighted something in our national thought which was then in danger of growing dim. The great revolutionary struggle for the free expression of a national consciousness which lasted from 1775 until the close of the second war with England was the direct result of that contact with the frontier. Just so the migration of great numbers of Americans into the Ohio

and Mississippi Valleys brought to birth the America which took sides passionately for and against the principles of Lincoln.

In this sense corn has fed all our great national movements, as corn had always been the food of the frontier. Exactly what is the urge which has drawn Americans, time and again, from the comfortable homes achieved by a previous generation to rude living on the edge of the great plains or the desert? Even in this day of oil-burning furnaces, glass-enclosed automobiles and television sets, that urge stirs in the blood of thousands of Americans making them ill at ease in our industrialized cities. These are men whose bodies are too big and too restless to sit behind office desks. Figures bewilder them; they have not cash-register minds. They are not challenged by competition with other men. If their neighbor makes a million in Amalgamated Amalgam, this does not affect their egos to the point of driving them to make two millions in Incorporated Inks. These are frontiersmen, though they may have degrees from Harvard, Princeton or Yale. They are frontiersmen from whom the American frontier which was first the sea, then the valleys of the Ohio, the Mississippi, and later the Great Plains, has retreated beyond hope of their finding it. They are the Sons of the Corn, though now alienated from their Mother. True to the archetypal pattern of the son, they rebel against the mother only to seek her again in another guise.

So America which rushed to civilize its frontier has been driven to replace it with the Country Club, the Dude Ranch, the Salmon Camp and Duck Shooting Preserve. On these improvised frontiers the Sons of the Corn make fumbling efforts to return to the Mother.

It seems apparent that much of the restlessness and ineptitude of present-day American life springs from this body of Americans who are born to and feel the urge toward a frontier which is now non-existent. They are in the sorry plight of the

frog which continues to kick spasmodically for some time after its legs have been amputated.

The first United States census, taken in 1790, numbered a population of approximately four millions. Two hundred thousand of these were living west of the Alleghenies. Louisville had fifty to sixty houses and three hundred whites. Ten years previous, Virginia had encouraged settlers in Kentucky by offering four hundred acres and an additional one thousand acres by pre-emption to everyone who would plant corn. Settlers were lured from New Jersey and Pennsylvania by reports of the richness of Kentucky soil which would grow turnips so sweet and juicy as to make a man forget the pears in the orchards along the Delaware. Pittsburgh was a city of log houses where money was scarce. Nails, lumber, axes, calico and flat-boats were paid for in wheat flour, corn, pork and lard. But it had a newspaper, the first to be published west of the Alleghenies, and a bustling river-front where broad-horns and flatboats were built and launched to carry passengers and cargoes down the river. Philadelphia firms had as much as \$150,000 invested in river boats. They kept fleets of Conestoga wagons busy carrying goods over the mountains to the company warehouses in Pittsburgh. One of these firms, Baynton, Wharton and Morgan, employed as many as three hundred and fifty boatmen. Many a young man—Stephen Girard was one—got his start in life as a river-way peddler.

When navigation opened in the spring of 1786, Pittsburgh was jammed with families waiting places on the boats to the new corn-growing lands downstream. Within forty days after the ice broke, more than one thousand persons with their household goods, cattle and tools had started down the river. Another seventeen thousand were to follow before ice blocked the rivers again.

The flatboats were weighted down to the water line with as motley a collection of moveables as any caravan ever carried. There were pineapple-topped four-posters too precious to be

left behind in Litchfield. Two generations had been born, wedded and had died in those beds. There were chests of drawers of Santo Domingo mahogany or of New England maple, carefully swathed in blue homespuns and patchwork quilts. There were Spode and Wedgwood and Lowestoft tea sets packed in rush baskets, and never left out of a woman's hands. Great Grandfather Griswold of Old Lyme had brought that tea set home in the *May Queen* to Great Grandmother. Putting it into her hands he had had to tell her that her youngest son Recompense had been washed overboard in a gale off Tenerife. There was little that was new in those boatloads. Even the axes and the mold-board plows had done service on Massachusetts and Connecticut and York State farms. The oxen, the cows, the squealing pigs made the overland journey with the family. Usually it was one family alone, but sometimes those who had been neighbors "back east" pledged each other to stake out lands that adjoined. "Weathersfield folks ought to stick together." So a group of families from New Jersey settled Cincinnati.

Spring and summer, the tide flowed on, hopeful, determined. Men thrust their hands wrist deep into the sacks of corn and shook the golden kernels in their palms, like dice. "There's the land, ready and waiting. And here we are, and here's the corn to plant our first crop."

By 1803, Ohio could count the sixty thousand settlers needed to make her an independent state. Even at that, more than one-third of her territory was a waiting wilderness.

In the Scioto Valley and along the Muskingum River, the corn grew taller than anyone had ever seen it west of the Alleghenies. Even the records of the Genesee country were outdistanced. "My uncle, Rufus Dana, stood six feet three and a half. He rode his horse down the alleys between the corn rows and stood up in the stirrups and held his riding crop as high as he could reach. But he couldn't touch the topmost tassel."

The women who had made the first stage of the journey west in the canvas-topped wagons, and the second in perilously loaded flatboats, following the ice down the river, stood at their doors and looked over the waves of rustling green leaves, crackling in the bright sunshine. "Leastways, we won't starve."

Starvation was the thought furthest from the minds of the men who drove their plows across the rolling fields and felt the deep wealth of that rockless soil. There was gold in those furrows. Corn was wealth. Corn fattened cattle for the drovers who were coming now out to this west country to buy beef, as they had used to go down to the southern cow pens. Cities like Philadelphia and New York had to have beef. Corn fattened hogs. Corn made bacon, pork and lard. In the smoke-houses, fires of hickory wood turned the fresh-killed meat to sweet-smelling rosy hams. The cities in the East had to have these. So did the planters in the West Indies. All these were salable in New Orleans.

Shrewdly, those transplanted Yankees knew that if they made a good product for which there was a steady market, the buyers would come for it. They were only a generation in advance of Emerson's philosophy concerning the better mouse-trap.

Those who did not come by road came by the river. Every day the traders' boats went by; flat, broad arks, familiar sights on the Susquehanna and the Delaware. Seventy-five to one hundred feet long and from fifteen to twenty feet wide, these were steered by sweeps which required the combined strength of six men. They put in at the docks of the valley farms and bartered for produce to carry to New Orleans. There were keel-boats that drew two feet of water, and consequently made fewer steps. There were store-boats that brought general merchandise to sell to the farmers.

At sound of the warning conch shell blown from the deck, the women would leave their chores to run down to the landing to see if the flag floating from the oncoming prow was red

or yellow. Yellow meant calicoes and linsey-woolsey, lute-strings and broadcloth. Red meant salt and molasses, tea, spices. It meant Sandwich glass and Britannia-ware teapots with the familiar stamp, "New Britain, Conn." on the undersides.

All these could be bought for corn, bacon, pork or lard, or for Ohio maple sugar and syrup.

Many of the boats had stills aboard and sold Pennsylvania rye whiskey at a quarter a quart.

"Say the word, farmer. If ye hain't got two bits, buy your rye with corn. Corn'll sell in N'Orleans."

Everything, apparently, would sell in New Orleans. Spain had signed an agreement granting Americans the right to clear their produce through that port free. The Mississippi leading from the farms to this market port was the most important road in the country. Benjamin Franklin had foreseen this. Give up our rights to the Mississippi and the entry to the Gulf? "I would as soon think of selling my neighbor my front door." Ships from New England waited in New Orleans for cargoes of produce to take to the cities on the Atlantic seaboard and to the West Indies. The largest part of the products, carried by American ships about the world, was agricultural.

"What's it like, down to N'Orleans?" the women asked curiously.

And the river boatmen told of Spanish fiestas and carnival processions, of wide-galleried plantation houses, of Creole beauties languishing on their balconies, of liveoaks trailing gray Spanish moss and crepe myrtles, and orange and lemon trees in flower.

"That's what N'Orleans is like, Ma'am."

To the farmers they spoke otherwise: "They say down-river the French are dickerin' to take back N'Orleans. Things ain't the same down there. You can't trust the Spanish varmints. Look at how they tried to get their hands on Kaintuck. Remember what Gordoqui said? 'As long as Kaintuck's in the Union, we won't give you free navigation on the river.' Well,

we got the freedom of the river, and we kept Kaintuck, but for how long?"

"You think there's trouble coming?"

"Listen, farmer, there'll always be trouble as long as there's some foreign country got a-holt of N'Orleans. Supposen the Spaniards just tear up the treaty and close the port? Or supposen they put a tax on your corn and pork? Or supposen Boney does get it away from the dons? Do you think he'd let your truck go through free of duty? And what if he did take it, and England was to go to war with him, and we had the British customs officers back on the river? I was just a little codger when they put the tax on tea, but I kin remember, like it was yesterday. . . ."

"So kin I remember. . . ."

The man leaning on a hoe beside the Ohio could look back to a day in late April 1777, when the apple trees in the Housatonic Valley were bursting into bloom, and there appeared over them in the west a cloud of dark smoke. He could remember the peculiar, acrid, burning smell. He could see his father stumbling into the dooryard from the field where he was plowing. "The British—they've got to Danbury. They're burning our stores. Damn 'em!"

"We'd ought to own N'Orleans."

"Own N'Orleans?"

"That's what I say. How are you farmers going to sell your corn and your hogs if the Spaniards or the French or the British kin dam up the river with a customs tax? You came out to the Reserve to make your living, didn't you? Same as me. You make yours on the land, and I make mine on the water, carryin' what the land grows. It's the land that keeps both of us goin'. But it's the river that lets us take our stuff to market. Think it over, neighbor. You'll see I'm right. We'd ought to own N'Orleans."

All up and down the rivers men were saying this. When an Ohio man met a Kentucky man at the ferry, they talked of it. Hadn't the first Continental Congress gone on record as say-

ing that "the free navigation of the River Mississippi is a clear and essential right of the United States"? In the river valleys men looked at the ripening corn and thought, "What's it worth if they can close the port at N'Orleans? Where'll we be then?"

"Where will we be" meant where will I and my wife and our children be, with no market place in which to sell our corn? What's the good of owning one hundred acres of bottomless farmland if you have no place to sell the crops you raise? What was the good of that trip westward, over the Alleghenies ("We buried little Dan'l under a flat rock by a creek back in Penn State") if European wars and European politics could snatch your harvest away from you?

In Washington, in the unfinished White House, Thomas Jefferson paced restlessly up and down the corridors still smelling of damp plaster and whitewash. It had happened. Spain had ordered the port of New Orleans closed to American goods. There were tons of Yankee shipping tied up in the harbor; and on the river, floating down, tons of farm produce to be added to the jam at the river's mouth.

In all the river valleys of the midwest resentment flamed. Thomas Jefferson had farmed in the Shenandoah. He did not need to be told that men who had grown crops for sale, and had these crops ready to harvest, would brook no interference between them and their market.

"Make the Mississippi free," thundered the midwest.

But how to do this? It was less than twenty-five years since the country had been at war with England. The Congress would never approve another war. At least the delegates from the eastern states would never agree to another war to benefit farmers in the Back Woods.

"If you don't make the Mississippi free, then we will," the midwest retorted. "We'll secede from the Union, if necessary. We'll fight Spain. We'll fight France. We'll fight any dam' foreigner who tries to stop our corn and hogs from going to market."

Letters to Carmichael in Madrid . . .

Two hundred thousand of our citizens are settled on the rivers. . . . These have no other outlet for their tobacco, rice, corn, hemp, lumber. . . . The free navigation of the Mississippi is necessary to us. . . . More than one-half of the territory of the United States is on that river. . . .

Spain was moribund. But north of the Pyrenees was a living France, with a soldier-dictator at its head. It was scarcely to be believed that Spain had made this move without advice from Paris. What would France do next?

Then word that Spain had ceded New Orleans and the Floridas to France.

"Frenchman or Spaniard," the river farmers shouted, "it doesn't matter which of 'em holds New Orleans. They must open the port. They must let our crops go through, free."

To Livingston, in Paris, Jefferson wrote:

The cession of Louisiana and the Floridas by Spain to France works sorely in the United States. . . . There is on the globe one single spot the possessor of which is our natural and habitual enemy. It is New Orleans, through which the produce of three-eighths of our territory must pass to market.

In Paris, Livingston, the American buyer, was no match against the French seller. Napoleon held out; the United States must take the whole of Louisiana or none. When Livingston hesitated, the Emperor hinted that there was also a time limit on the offer. Livingston agreed, and trembled over what the President and his countrymen would say.

Entrenched New England raised a long wailing cry over the purchase; forgetting their own brothers and cousins and sons in the Ohio country; forgetting that New England's ships carried midwestern foodstuffs. All they thought of, apparently, were the fifteen millions of dollars added to the national debt. How did that madman in the White House think the debt was going to be paid? Did he expect to get so many votes from the raccoons and polecats of the Back Woods that he

could afford to discredit himself with the country's sound business interests? American business couldn't carry the burden he put on it. . . .

So stormed the Philadelphia merchants who traded down the Delaware, and the Baltimore wheat-flour dealers. So protested the New York bankers, and the Bostonians who were more interested in whale-oil than in lard, or in markets for hogs and hominy. There was no use telling these grumblers that the President's orders to his commissioners in Paris were to offer thirty-four millions of francs for New Orleans alone, or fifty millions for New Orleans and the two Floridas, but Napoleon had forced the entire Mississippi watershed upon them. Livingston had been left no alternative but to purchase the corn belt.

The protestors summoned their forces to defeat the President, who was, himself, troubled in his Constitutional conscience. How was he going to reconcile the Purchase with his literal reading of the Constitution? Thomas Jefferson had no bitterer enemy than John Marshall, the Chief Justice. Marshall might have lent his power, prestige and decision to those who opposed the Purchase. But the Chief Justice was born a backwoodsman. He had stood on a ridge in the Alleghenies and looked away to the west. He believed, apparently, that a country as big as this would have to stretch its hide once in a while.

When the United States flag was run up over New Orleans just before Christmas, 1803, it waved simultaneously over some 828,000 square miles of Florida, Mississippi, Louisiana, Arkansas, Missouri, Oklahoma, Kansas, Nebraska, Iowa, Minnesota, North Dakota and Wyoming that were now, for the first time, American soil.

"How," the undergraduates at Williams College demanded indignantly, "did the President think this country was going to wag such a tail as that?"

Before the frost was out of the ground the following spring, a tide of settlers was rolling into that vast new terrain as twenty

years earlier settlers had poured into the Ohio and Illinois country. Men in the sugar camps along the Ohio looked up to see pack-horses moving westward over the frozen trails.

"Howdy, strangers? Where you folks goin'?"

"Goin' west. Goin' to Louisiany. Goin' to farmin' where they say a man's crop can't fail. How fur is it to Louisiany?"

The expedition of Lewis and Clark financed by Congress for the opening up of the northwest territory was already turning men's minds to the new frontier.

With that continuous drain on the East it was a wonder there were any people left in New England, New Jersey or in York State. Within the first fifty years after the opening of the Mississippi Valley the new territory gained in population over the increase in all the thirteen original colonies in the first century of the country's development.

Of the fourteen Presidents between the passing of John Quincy Adams and the advent of Theodore Roosevelt, ten were either born in the Mississippi Valley or had been residents there.

The tail, which had seemed so outlandishly long to the young men at Williams College, now threatened to wag the dog.

The trail followed close to the river's edge on the Ohio shore up to Marietta. West Virginia lay over the river. The deep-folded hills forested in chestnut, beech and birch ran down to the giant sycamores along the shore. The deer came down through those forests to drink delicately at the running river, and to nibble the sedge grasses and alder shoots. The deer did not always stop at the river. They swam over, cunningly letting the current sweep them in close to the lee of the Ohio shore; then they scrambled out, and up into the tempting cornfields.

When the Indians had lived along the river, the fields of corn they planted had been smaller, the stalks were not so tall or so strong, nor did they yield as many ears. But the

Indians used to burn the brush in a wide band around their plantings, which allowed the deer no covert. And usually there were several sharp-eyed small boys, armed with bows and arrows and sling shots, on guard against the marauders from the woods.

The white men who had taken the country from the Indians planted their fields more lavishly and were more careless in guarding them. But the white men had guns. They did not wait for the deer to swim the river and fatten and grow sleek on their corn. They hunted the deer in their own forests, up and down the mountain slopes. And though they were clumsier and noisier in their tracking than the red men were, their guns were as usable in the woods as in the open—which the Indians' bow and arrows had not been.

The white men built houses in their cornfields. The first house was usually of logs with the stones gathered from the cornfield made into an end chimney.

Sometimes they did not go to the trouble of putting up a cabin. There was one family lived for a year or more in a hollow sycamore tree by the river. The man and the woman and their children were as cosy inside its bark wall as the gray squirrels were in their holes in the upper branches.

But after a year or two, the white men usually set to building a taller, wider house of brick or stone beside the cabin, which became the kitchen of the new dwelling. Gradually, out beyond this, a cluster of other buildings grew up, following the farmhouse patterns of Massachusetts and Vermont. The new house had a dooryard with lilac bushes and snowballs, and a flowery almond grown from a slip a woman had brought in a pickle jar all the way from Connecticut. But beyond the house on all three sides, the cornfields ran away to touch the horizon. From the time the first green shoots appeared out of the damp earth the fields were alive. Even the lightest breeze fluttered the long leaf ribbons. Rain at night tinkled on them. Under the midday sun they crackled as they grew.

The men who lived in the houses set in the cornfields knew

the full sweet taste of independence. They courted no man's favor, felt no man's scorn, feared no man's competition. They held their own lives in their own hands. While the fields yielded they had bread and ham and pork and bacon and chickens and eggs and milk. And while the river ran by their gates they had a convenient market where a surplus of produce could be bartered for other goods, or sold for cash.

The man standing beside a little mound of luggage on the flatboat that rounded a bend in the river on a summer morning in 1805 looked at those farmsteads and thought these things. The sight of them seemed to lift a great load of weariness from his soul.

He was a little man, and elegant, even in his traveling clothes. A man, one would say, more at home in a lady's drawing room, or bowing in a minuet than on a battlefield or a wilderness trail. Yet he had a reputation on these, too.

"What a country!" he whispered. "What a chance for wealth, for power, for a new life."

His eye was quick to catch an otter crouching on the bank to watch the boat before resuming its fishing, and quicker still to see a white horse and its rider on the Marietta Trail.

The rider was a woman—young, for even at that distance it was evident that the horse was spirited and that she matched its spirit with her own. And—the man felt sure—beautiful. Only a young woman serenely confident of her charms would have worn that long, full-skirted habit of crimson velvet that flowed along the horse's flank, and that broad-brimmed crimson velvet hat with the floating white plume. So attired, she might have ridden straight out of the Bayeux tapestry onto this American trail winding between the river and the ripening cornfields. So Romance, in the figure of Margaret Blennerhasset, and Tragedy, in the figure of "the man who shot Hamilton," met and passed, and were destined to meet again in the cornlands by the river.



VIII

Millions in Tassel

WHATEVER else the trial of Aaron Burr accomplished, it had the effect of putting the corn belt on the map.

Those who had grumbled over the purchase of Louisiana as an unwarranted expense awoke to the fact that the lands added to the country's boundaries had a value estimable in dollars. The eastern states, proud of their humming little mills, their inventions, their Yankee notions and gadgets, proud of their steamboat chug-chugging up the Hudson, suddenly became aware that the fertile bottom lands of the midwest put farming on a basis with banking, with cotton-spinning and manufacturing.

Up to that time the majority of Americans thought of a farm as land which gave those who worked it—provided they were industrious and lucky—shelter, food and some homespun clothing. But the idea of a farm which paid its owner cash dividends was brand new. It was also, to the New England mind, slightly shocking.

Didn't the Bible say, "In the sweat of thy brow shalt thou eat bread"? It didn't say anything about getting rich raising a thousand times more food than a man needed for himself and his family, and selling this to city dwellers a thousand miles away.

The second war with England which was urged on the country by the southern planters and midwestern corn farmers made the eastern industrialists even more conscious of an up and coming agrarian population living west of the Alleghenies.

During the struggle, and after it, the agrarian interests held

the center of the stage in Washington. Henry Clay, "the mill-boy of the Slashes," who had cleared land for a corn-title in Kentucky, was the eloquent spokesman of the corn-growers in the river valleys. More clearly than any man of his time he envisioned the future of the corn belt.

"Create an American System. . . . Encourage the farmers in the midwest. Encourage settlers to take up land out there. Let them know that the land will make them rich. Let our land create our national wealth and create a body of customers for the manufacturers. What better security can you have for goods on credit than the fertility of the American soil?"

Congress opened land offices in the new territory which immediately did a "land-office business" selling lots of eighty acres at \$1.25 per acre. The old Ohio Land Office in Marietta still stands. The total business transacted within it probably ran into many billions of dollars.

People had faith in the American soil. That faith amazed some of the Europeans who visited the country. Harriet Martineau marveled at the Americans' appetite for land. "It is the aim of all action, the cure for every social evil," she wrote.

The value of that land was created by the corn it would grow. Eighty acres meant so many bushels; and so many bushels of corn stood for so many dollars. Land which was no good for corn was no good at all, according to the business man's point of view. Was it not the great corn wealth of Kentucky which made Spain cast greedy eyes on that territory and plot with Wilkinson to keep it out of the Federal union?

Henry Bradshaw Fearon, an Englishman who spent nine months in the Mississippi Valley during 1817 selecting sites for the settlement of English immigrants, divided the pioneers into four classes. First, the squatters, hunters and trappers who held tenaciously to their tomahawk rights. Second, the small farmers who worked from eighty to one hundred and sixty acres. Then the "strong-handed farmers" with acreage from five hundred to one thousand. Lastly "squires" whose tracts

were too vast for surveying. Many of the pioneers, he reported, had not owned twenty dollars in cash when they came west. Still there was little money in circulation. Purchase was by barter and "swaps."

These men enjoyed a freedom that struck strange to a European. True, each man was perforce his own farmer, butcher, miller, blacksmith and shoemaker. But on his land he was a complete social unit. When a new settler came to him to buy seed corn he could set his own price. His wealth was all under his own control.

There was no denying the power of Clay's arguments while the waters of the Mississippi continued to float tons of produce to the Gulf. New Orleans, so fed, grew phenomenally. In 1831, the year when Lincoln made his trip down-river and wandered along the busy levees, the imports and exports amounted to twenty-six millions of dollars. Five years later they were double that sum.

The steamboats had a lot to do with it, making two-way travel on the rivers possible. Nicholas Roosevelt's *New Orleans* puffed and chortled along the reaches of the Ohio from Pittsburgh, belching wood smoke and cinders over the cornfields on the banks. A lot of people regarded this new invention with suspicion and fear. When Charles Dickens made his American tour he was counseled while traveling on the Mississippi to stay aft as much as possible, for "steamboats usually blew up in front."

With the steamers on the river, besides all the other craft, a man could cut logs for a raft, load this with farm produce and float down to New Orleans to sell crops and lumber in a ready market. Then, if trade was good and he had a taste for luxury, he could buy a return passage on one of the steamboats. Aboard, if he had luck, he could win his passage money at poker or rolling dice.

It was not likely that the eastern cities would watch the mounting prosperity of New Orleans without wanting to tap some of that rich stream for themselves. How to divert the

current of corn wealth? There were four natural gateways through which it might be brought to the seaboard. These were the four main routes through which settlers had moved into the Great Valley. There was the Warriors Path, or Wilderness Road, through Cumberland Gap into Kentucky. There was the route across the Great Kanawha to Boonesboro; there were the road to Pittsburgh on the Ohio, and the road through the Mohawk and Genesee Valleys to Buffalo and the lakes. The last, through level country, offered fewer obstacles in development as a canal route. Let the wheat, corn and pork come that way to enrich the New York merchants, instead of being sent to the Gulf, and then reshipped from New Orleans.

The Erie Canal was opened in 1825. Albany declared a holiday on the day in October when the *Seneca Chief* made the first trip from the Great Lakes to the Hudson. There was a procession of decorated carts loaded with produce brought from western farms.

The canal boats which brought the wealth of the west to the east passed, at the locks, other barges moving slowly westward with kegs of nails, plows and farm tools, furniture, clocks and yard goods. Henry Clay's American system was working. The east manufactured for sale to the west, and was repaid in food. In New York State the subsistence farm was a thing of the past.

Still the tide of migration moved on. Every country in Europe added to it. The news of fertile and cheap cornland had spread around the globe, kindling the imagination of poets and startling peasants out of their apathy. Why, in that country, it was reported, a man could plow a furrow forty miles long. When you broke the prairie sod and planted the American corn you were sure of a harvest. Corn couldn't fail. Later, when the corn had ravished land of its superabundant strength, you could sow wheat. There was no possibility of hunger in America.

Every packet to Boston, New York, Philadelphia and Balti-

more brought immigrants: Irish, Germans, Danes, Swedes, Norwegians. The Irish kept close to the cities; they were of different breed from the Ulster folk who had helped settle the Back Woods. The others turned west. They were strong-armed men, eager to work on the land and to own the land on which they worked. They sat on the decks of the barges that were towed up the Hudson behind steamers like Captain Harvey Temple's *Connecticut*. Cap'n Temple made nothing of a string of sixty to eighty barges. When Cap'n Corneel van der Bilt threatened his supremacy on the river, Cap'n Temple hitched up one hundred and eight barges, ordered all hands to stoke the boilers, and steamed up the Hudson with a broom lashed tauntingly to his smokestack.

Through the Mohawk Valley the canal threaded towns, and farm lands where grain ripened. The immigrants got off and walked along the towpath, feeling the good earth under their feet, drawing in deep breaths of the rich, warm smell of August.

Beyond Buffalo the lakes spread like great inland seas. White-sailed brigs rode the waves, laden with grain and lumber. There were steamboats on the lakes, too. The first of these, named *Walk-on-the-Water* for the Wyandot chief, was built in 1818 on the very spot where La Salle built his sailing ship *Griffin* in 1679.

In Cleveland, in Chicago, in Detroit, the foreigners found work. Any work did, so long as it allowed them to save toward the purchase of land. So the cities of the midwest grew on the labor of men whose hearts were set on being corn farmers.

As soon as they had a yoke of oxen, a home-made wagon, tools, a plow, sacks of corn, they left the towns and started out across the prairie. The matted grass was hard to break; but a swing of an axe, and there would be a deep gash into which to drop four kernels of corn. Why four? The Norskies, the Hunkies, the Germans, the Danes didn't know—only that that was the American way. They tamped the earth down over the seed with their heavy boots, and moved on two steps to swing the axe again. And again.

The roots of the corn did what their tools would not do. They broke the tenacious prairie sod. Next year it was possible to put a plowshare into the ground and to drive a long straight furrow. The earth that rippled away from the blade was dark and rich and sweet to smell.

Soon there were a sod hut and a cornfield where there had been only prairie grass. Some day there would be a cluster of farm buildings, a silo, a mill. Then a village with a school and a church. Years later there was a railroad station and a post office. And after that, many houses, gas-filling stations, a movie theatre, Coca-Cola signs in Neon lights, beauty shoppes—a city.

"It is not to our interest," cautious Thomas Jefferson had said, "to cross the Mississippi for ages." Not even the Mississippi could hold back the pressure of thousands of eager land seekers. The Pembina caravans made the five-hundred-mile trip up into the Missouri country for furs. The traders brought back word of rich lands beyond Pig-Eye's—the hut-saloon of a one-eyed Irishman where Minneapolis now stands—and the corn-growers began to dream of a new domain.

One day a man loaded oxen and a plow on a raft and crossed the Mississippi close to where Davenport now stands. On the western shore he harnessed his beasts to the plow and shouted to them. He felt the plow pull at his armpits. Behind him a furrow darkly streaked the sod. The man bent, took up a handful of earth, and smelled of it. He smiled. Still smiling, he urged the oxen on toward the horizon. They did not stop until they came to the bank of the Missouri.

So the first corn grew in Iowa.

The land which the Indians gave up so sullenly was not won without labor. In September 1832, a young man, lacking one month of being twenty-one, journeyed by canal from Albany to Buffalo. Thence he went by steamboat to Detroit, and from Detroit to the fort at Chicago. Young Conant "located" in Indiana, twenty miles outside of Chicago. He was a me-

thodical young man and he kept a diary of his activities through four years. A brief excerpt—and the brevities are his own—reveals what life on a prairie farm was like a century ago.

1836. Jan. 1. Attended to the survey of my claim.
 2. Drew rails.
 3. Sunday. Wrote poetry.
 4. Made shelves and split rails.
 5. Went to Chicago with a load of potatoes.
 6. Sold my potatoes for .75 a bushel.
 7. Cut apples, worked at my house, husked corn.
 8. Attended a meeting of settlers for securing to each man his present claim.
 9. Cut rail and timber.
 10. Sunday, went to Chicago.
 11. Commenced thrashing.
 12. Still thrashing.
- May 10. Mrs. Hoar and Betsy Kelsey arrived.
 11. Planted corn and prepared for the wedding.
 12. Married Betsy Kelsey.
- June 3. Made a table and borrowed 6 bu. of potatoes to be paid back with interest in the fall.
 4. Wife 18 today. Made a few articles of furniture. Made a churn.
- Sept. Heard big wolves howling. Hunted deer. worked at shoemaking. Made a coffin for H. Dougherty. Plastered my house. Dressed pig and calves torn by wolves. Dug a well. Killed a badger. Killed a wolf. Corn half destroyed by blackbirds. Set out small trees. Took up a bee-tree to hive for honey. Hunted deer.

It is quite understandable that the diarist should have condensed his records, with so much on his hands to be done each day.

The years 1835 to 1836 marked the heyday of speculation in government lands, even though ten years later Wisconsin was offering 500,000 acres at \$1.25 per acre on thirty years'

credit. The interest of seven percent was collectable annually in advance. A man with one hundred dollars in cash who went into that country moved like a prince. Speculators were quick to take advantage of the bargain and bought vast tracts which they held, and then resold at double the government's price.

Meanwhile, in Chicago, in Kansas City, in Minneapolis, the corn from the farms was sold either in its natural state as grain, or as hogs and lard. Not only the men who raised these but men who traded in them in the cities grew rich.

The purchase of Louisiana had been effected in 1803. In 1845 Texas was annexed. And in the same year, Oregon. In 1848 California was added to the union. Five years later the Gadsden Purchase completed the boundaries of a country which stretched from Atlantic to Pacific, from the Rio Grande to the Great Lakes. None of the eastern financiers objected to this expansion. Instead, they were quick to invest in western properties and western futures. Above all, they were interested in the railroads for which engineers were already drawing up plans and possible routes.

But even the most imaginative among them were unprepared for the rapid expansion of the country. Horace Greeley, whose editorial advice to young men to go west was taken up by promoters of western lands, confessed himself dumbfounded by the numbers who took the trail to Oregon.

The country lying between the Missouri River and the Rockies was marked on maps "The Great American Desert." It was an arid plain, overgrown with sagebrush and bunch grass, good for nothing but prairie dogs and rattlesnakes. A few cattle grazed on ranges, but even these would not make that country pay unless it could also produce corn to fatten the young steers for market. Around Denver there were the mines, a source of speculation. But the rest of the territory appeared to most of those who had ridden across it as waste land.

The first counter evidence to this was brought by the Mormons. The followers of Joseph Smith took miles of the Great

American Desert and by irrigation turned these into crop lands. There might be black magic in what the Latter Day Saints were able to do with sagebrush country but, if so, it was a trick worth acquiring.

The railroads, with millions of acres in the sections along their rights of way which Congress had voted them, and which they proposed selling to farmers whose farm produce would make the railroads pay, prompted colonies to turn the Great American Desert into another Great Valley. The Central Kentucky Emigration Society, The Wyandotte-Kansas Colony, The German Colonizing Company of Chicago, the Chicago-Colorado Colony under the Unitarian minister Robert Collyer, advertised the future values in crops of the lands they had to sell. They had an enthusiastic agent in the editor of the *Star of Empire Magazine*, published in Denver, whose columns rhapsodized the futures of Colorado, Nebraska and the Dakotas.

Not less enthusiastic was Nathan Cook Meeker who held, after the Civil War, the post of agricultural editor of the *New York Tribune*. Meeker was by nature an idealist. He had been deeply influenced by the ideas of the French socialist, François Fourier, and had gone to Ohio with his young wife to pioneer. There, he said, "I learned what could be done through co-operation." There was not the co-operation in Warren that Meeker needed to make a success of his venture. Followed a period of store-keeping in Hiram, Ohio, and then another farming venture in Illinois. It was then that Meeker heard about the success of the Mormons' venture in Utah. It fired him with new enthusiasm for the dry lands and with plans for irrigation projects there. But the Civil War came, and Meeker went as a correspondent with Grant's army. His despatches to the *New York Tribune* made news.

After the war was over the paper kept him on, with the title of agricultural editor. Writing from his farm on the Kansas frontier, Meeker began to inspire youth in the eastern

cities with dreams of irrigation farming in the dry west. Greeley, always the editor, sent for him to come on to New York to discuss the paper's policy. In the plush sanctity of Delmonico's, the plan for the *Tribune's* promotion of an agricultural colony on the Cache la Poudre, midway between Denver and Cheyenne, was formulated.

The first article on this project was published on February 14, 1869. Immediately the paper was showered with letters. More than three thousand eager readers demanded to know how to join the colony. The offices in Cooper Union were besieged. Ultimately seventy thousand acres were bought and subscriptions at \$155 were sold to members. Each subscriber could also select a town lot for \$25 or \$50, and could take up eighty acres of government land for \$75. The town of Greeley was laid out with streets, sites for churches, schools and a ten-acre park.

In April 1870, four hundred colonists set out for Colorado. They came from Massachusetts and New York, from Ohio and Indiana where Meeker's name was known. He was the Moses, who was to lead these eager farmers westward, as Rufus Putnam had led the colonists to the Ohio country.

Greeley was a town of "several stern-wheel shanties and a few one-horse tents," "a prairie-dog village, bounded by prickly pears." The first wheat crop "withered like a forlorn hope." The irrigation ditches which had been dug with great labor and expense were too shallow to carry sufficient water to alleviate the arid soil. Then came the grasshoppers. They came over the horizon in a dark cloud. They settled on the gardens and spindly orchards and ate every green leaf and shoot. Greeley was a shambles. A place of death inhabited by madmen. You couldn't shoot grasshoppers. Frantically, the town merchant offered a new suit of clothes for one million grasshoppers. A man brought in a sackful and dumped them, dead, on the floor of the store and demanded the suit.

"Not dead grasshoppers; live ones," the merchant insisted.

Next morning the man was back again. With two sacks. He shook the insects out into the store, very much alive.

"Count 'em," he commanded.

Despairing of a future in farming in such a country, the colonists called a meeting and discussed plans for using what money remained in the fund for a woolen mill and turning the barren crop lands into sheep ranches. Meeker protested. The battle waged long and bitterly. "Dig deeper ditches," he urged. "Dig more ditches. The water is there in the river. We have only to bring it to the land to make the country bloom."

Ultimately Meeker and his ditches won over the woolen mill. The ditches were dug, the river came to the land, and the land began to yield. The wheat crop broke a record. The corn filled the granaries and the town's elevator. The clover was a better stand than any yet grown in that country. The potatoes brought high prices in the Denver market.

And Meeker proved his point. The dry country, when irrigated, was rich. It would grow food for men and to fatten cattle on the ranges. The colony had but one more enemy, the Indians. There was trouble with the Sioux, especially since the lands from which they had been driven were proved to be valuable. Finally there was guerrilla warfare. After one of the attacks Meeker wrote:

This stopping plows by bullets is by no means a new thing in America, for, so to speak, the plow has plowed its way from the Atlantic to the heart of the Rocky Mountains, through showers of bullets, and the American plow is yet to turn furrows across China and the steppes of Tartary, and even invert the soil around sacred Jerusalem. SPEED THE PLOW.

It was Nathan Meeker's last editorial. A few days later, while on business at the White River Agency, he was killed by an Indian.

Today, in Weld County, Colorado, more than three hundred and seventy thousand acres are under irrigation. One-

seventh of all the beet sugar produced in the country is grown there, and the annual wheat crop averages three million bushels. And in the University at Greeley young men are educated to be farmers on the Great American Desert.

The story of Greeley, Colorado, was repeated with variations in a score of other localities. Towns which began as colonies used co-operative measures in raising and marketing crops. With the coming of the railroads, grain elevators were built for the shipment of wheat and corn to the markets in Chicago and elsewhere. Many of these elevators are farmers' co-operatives.

More than three-quarters of the nation's annual corn crop never leaves the farms, or the localities where it is grown (except on the hoof). It is fed to hogs, to cattle, horses and poultry. More than one hundred million bushels go to the millers to be turned into corn meal and flour, to the distillers to become alcohol, and to the makers of breakfast foods.

The balance, close to eighty million bushels yearly, becomes the source of our supply of starch, corn syrup, glucose, dextrose, cooking oil. It appears before us in candy, in ice cream, in rayon textiles, in soap, in paper, in chewing tobacco, in bath powders, in fireworks and explosives, in yeast and in gluten feeds for cattle.

No other grain known to man has so many uses which are convertible into dollars. No other crop grown in American soil supports so many industries, gives employment to so many men and women, accomplishes such far-flung ends.

It is truly the totem of the American people.

There is an affinity between it and the American people whose life it has made, and whose destiny it has shaped and shared. These are the secrets it whispers when the leaves rustle in the summer wind—tales of Tussore and Kemps working out their freedom by sowing the grain to feed their captors; tales of Cornstalk of the Shawnees and his brother Silver Heels, and the whistle of bullets in the Back Woods; tales of Negro slaves

hoeing corn, baking hoecakes in the embers, remembering Africa and freedom; tales of Deerfield and the Genesee country, of the Wilderness Road to Boonesboro and of the little company of axemen who cut that road and who sat by their fire at nights, eating hot pones and listening to their leader read aloud *Gullivers' Travels*; tales of the Great Valley and the Father of Waters; tales of the Montezuma and the Maya who preceded him; tales of the Plumed Serpent and of Coatlicue the Earth Mother.

The corn has its own poets. Not the least of them sings:

*Always, I never knew it any other way,
The wind and the corn talk things over together
And the rain and the corn, and the sun and the corn
Talk things over together.*

Some of the things they tell each other are in this book.



IX

Hogs and Hominy

Q. What makes more noise than a pig under a fence?

A. Two pigs.

Q. What makes more noise than forty-five million pigs going to market?

A. Thirty-seven million pigs.

OF COURSE it doesn't make sense. But then that was the charge the packers and a large proportion of the breakfast-bacon-eating public brought against the Agricultural Adjustment Act—that it didn't make sense—when it put this riddle to the nation.

In 1937, the squeals of eight million pigs which did not go to market were heard from the Red River of the North to the Pecos. Newspaper headlines screamed, the packers representing America's three-billion-dollar meat industry went to law, and hundreds of housewives in Los Angeles, Detroit, Chicago, Cleveland and New York stormed the butchers' shops and demanded cheaper pork and more of it.

Hogs and hominy are now a chapter in American history. Those eight million pigs wriggled under the fence and into the United States Senate and the Supreme Court. They broke the A.A.A. They made it plain to the whole world that we had a hog situation.

The hog situation and the farm situation are inseparable in a country where more than 60 percent of the farmers raise corn and hogs. More than 40 percent of this country's corn crop goes into pork and lard. Hogs and hominy work together like the blades of a pair of scissors. There have been periods when they cut coupons for the farmer. Recently they have cut him in two.

When Ponce de Leon landed in Florida he brought with him thirteen sows. The dons were pork eaters. Estremadura, the province which sent out the greatest number of conquistadores, has a pig-raising industry. Pizarro was a swineherd of Trujillo. The hams of the province have been famous among epicures since Saint-Simon praised their delicate, sweet flavor—due, he believed, to the vipers on which they fed.

Doubtless the “thirteen sowes,” which obligingly increased to a herd of three hundred within one year, were of this Estremaduran breed. When de Soto started on his march he drove some of these swine before him; possibly to eat up the rattlesnakes. Runaways from de Soto’s advance guard were the progenitors of the wild razorbacks in the south.

When John Smith left Jamestown, his mind was easy about the colonists’ food supply. There was corn a-plenty, and there were “60 odd pigges and 500 chickings.” The “pigges” were the natural increase of three sows imported a year and a half before.

In Florida, in Virginia, and later in New England, swine thrived on the native maize. The settlements along the Connecticut raised hogs and sent ships from Essex loaded with pork and lard to sell in the sugar islands. Indeed the swine, by their numbers, became a problem. There was an ordinance—how Connecticut enjoyed making a law about something!—that roving swine must be ringed; and that a man could claim for his own and kill or sell any mavericks he caught in his corn-field.

When the great westward movement began, the pig moved west with the settler. Tamworths, of Wiltshire origin, made the trip down into the Shenandoah Valley. Their descendants, already more American than British, took the Wilderness Road into Kentucky and on to Missouri. Black Mule Foots wriggled inside canvas sacks in the Conestoga wagons that took the Palatines and Moravians from Pennsylvania to the Ohio country. There was at least one pig on every flatboat that floated down to Marietta and to Cincinnati. Let out of the

sack, and unhobbled, the squealing porker quickly found his way to the corncrib.

During the first half of the last century the center of hog-raising in this country was the Ohio and Tennessee Valleys. Eastern cities were already looking to the west for their supply of bacon and lard. The hogs raised on eastern farms were used by the farmer and his family, and sold to neighbors or a local butcher. When I was a girl, in Putnam County, New York, most families in the village had a barrel of salt pork put down in the fall. Usually the barrel was kept in the cellar. Once, I remember, when I was spending the day with a small playmate, we played hide and seek. I went up into the unused and unheated third story to hide, opened a door into a "summer bedroom" and shrieked at sight of a large dead hog laid out on the bedstead.

But Henry Clay's American System encouraged the centralization of industries. The East manufactured what the Midwest needed to raise food for the East to eat. Nails, duffel cloths, plows, hats, shoes, tools, spices, calicoes and Bibles were returned to the eastern settlements in corn, wheat, pork, lard, beeswax, beef. The Mississippi River trade was largely in hogs and lard. Farmers soon found a profit in turning their corn into pork and shipping this to New Orleans.

Commerce on the Great Lakes, bringing western farm produce to the Erie Canal, boomed the city of Buffalo which had not a single white settler when the Federal Constitution was adopted in 1787. Sixty years later, in 1847, 98 steamers, 4 barques, 82 brigs, 495 schooners, 23 sloops and scows unloaded cargoes to be forwarded by canal. There were nearly two million barrels of flour in those cargoes, and half a million barrels of pork. The Buffalo elevators received six million bushels of wheat, and half that amount in corn. The balance in favor of wheat was leveled by three and a half million pounds of lard.

The diarist Philip Hone, who was Mayor of New York, has

left a memorable picture of what he calls "one of the triumphs of this great American staple production."

I witnessed on Thursday (Jan. 28) a procession of 20 or 30 carts, the forward one being drawn by 6 white horses and decorated with flags, up Broadway to the grunting of martial music, each cart loaded with 4 or 5 enormous dead hogs. The whole number was 106 hogs, weighing 40,262 lbs., an average of 380 lbs.

These overgrown animals were raised by 5 farmers of Burlington County, N.J. and sold to a pork butcher here. They were nearly uniform in size, with short, duck legs, like Grant Thorburn's; little twinkling eyes peeping out between two mountains of fat, like pins upon a pin-cushion; and hams as round as a full moon and luscious as a turtle's calipash.

There was *Indian corn* written in legible characters upon their jolly features, and shining out of their swelling sides; dead though they were. They had, out of benevolence to mankind, laid down their characters as swine to assume that of pork. Every spare-rib and every link of sausage, as well as the more important parts of these children of Ham, will sing the praises of *Indian Corn*.

We have seen how the lure of new and ever richer cornlands drew farmers into Illinois, Indiana, across Kentucky to Missouri, and up into Iowa. Where they planted corn, they raised hogs. And where the corn flourished, hogs were healthy, fat and prolific.

The British might deride American bacon and the corn which made it fat. Americans retorted that they liked it that way. They wanted their rashers crisp, not flabby. And they wanted lard for their frying pans and for the crust that covered their pies. Americans wanted pie; lots of pie, and often. The corn and hog belt supplied them with the wherewithal.

And where the corn grew and hogs grew fat, the railroads came. As a matter of record corn was, and still is, the largest crop in every state of the Union. Most of it was, still is, fed to livestock on the farms where our corn is grown. But the livestock had to be carried to the packers. Rail kings, smoking long Havanas in their offices in New York, spoke reverently of

freight rates and the business that could be done. So many hundreds of thousands of hogs carried to the packers in Omaha, Kansas City, St. Louis, or Chicago to be butchered and processed, and so many million pounds of ham, bacon, sausage and lard carried to the hungry and rapidly spreading cities in the East, meant dividends.

The coal carried by the Beech Creek Railroad bought a Duke of Marlborough for Commodore Vanderbilt's great granddaughter. The New York, Chicago and St. Louis Railroads which Calvin Brice sold to W. H. Vanderbilt at a price so exorbitant that people said the rails must be made of nickel plate, was a farmers' road. It carried hogs and steers and tanks of grain. So did the Illinois Central, which paid for the flamboyant society career of Mrs. Stuyvesant Fish, and set up the Harrimans in Newport.

The dividends paid by midwestern roads bought private cars for the officers of the roads, yachts, race horses, political careers, collections of old masters. Not inappropriately William H. Vanderbilt had a marked preference for the paintings of Rosa Bonheur. They paid for presentations at Court, titles and coronets.

Beneath and supporting much of the panoply of the Gilt and Plush Era was the American pig.

On their way to market those pigs made money for the midwest. They built towns where none had been, and they raised towns to the status of cities. They put up barns and houses. They bridged rivers, paved town and county roads, endowed universities and churches. They gave farmers' sons and daughters college educations.

The magazine *Fortune* gives the story of one farmer in the corn belt which is typical of many more in that area. *Fortune's* farmer is Benjamin Ray Summy, of Lansing, Minnesota. Mr. Summy came to Lansing in 1889, when he was eighteen years old.

He bought his first eighty acres with a \$100 down payment,

earned enough on corn and hogs to buy another eighty, and another. His land today is worth \$110 to \$125 an acre. He owes not a penny and made money every year except 1926 when he was hauled out. Of his four children, two grown sons help work the farm. This fall [1938], he has 110 hogs which should fetch him about \$4,000; sixteen head of cattle worth \$2,000, and sixteen lambs worth about \$150. He also milks a string of dairy cows. . . .

Here is a career built on corn and hogs.

Let us take a look at these creators of national prosperity. Whether the race of the pig is Berkshire, Duroc, Poland China or Mule Foot is a matter of individual taste. All these breeds have their champions. The word is true in both senses. The first three breeds are the aristocracy of pigdom. The Mule Foot is the native hog of Africa. It was the variety generally kept in Pennsylvania, Ohio and Maryland one hundred years ago, and the strain has not been lost. The sows are reputedly quiet mothers who give large litters. The Mule Foot is a good forager and puts on the first two hundred pounds of weight at less cost than do the pedigreed breeds.

A pig should weigh two hundred pounds at ten months. And those first two hundred pounds should not be made on corn. Pigs can't grow bones and muscles on an all-corn diet, and a pig of small frame can't carry as much fat as a big pig can. Therefore a mixed diet—preferably alfalfa pasture and corn—is recommended, with proportionately more corn as the pig matures, in order to fatten it.

All sorts of other pig feeds are used, among them fish-meal, peanut meal; millet and shrunk wheat; cotton seed, whole and pressed; pressed potatoes; cow peas; cow beans; middlings. In the South, when the acorns fall, the pigs are turned out to feed on the mast. Mast-fed pork has something no other kind can have. At least, so the Southerners say. Hams from mast-fed hogs, smoked over hickory for six hours daily for six days, with occasionally a handful of juniper berries thrown on the hickory to spice the smoke, are an American delicacy to place beside the cheeses of Brie and the wines of Champagne.

The curing of hams is still done on many farms and by recipes in use for generations. Naturally these home-cured hams have an entirely different texture and flavor from the rapidly and chemically processed hams the packers sell. But you could not expect a commercial packer to go through the following ritual:

HOW TO CURE HAMS

Rub the hams all over, and well, with plenty of fine salt, working the salt into the skin and around the hock. Pack the hams, skin side down, in a box and leave them for several days. Then rub them thoroughly with a mixture of

- $\frac{1}{2}$ lb. brown sugar
- $\frac{1}{2}$ teaspoon black pepper
- $\frac{1}{2}$ teaspoon saltpeter
- $\frac{1}{4}$ teaspoon red pepper.

Work this mixture well into the meat, especially around the hock, where fly is apt to breed. Repack the hams in the box with salt around and between them and allow them to stand for six weeks. After this they should be smoked over hickory wood, for six hours a day for one week. Air the smoke house daily to prevent the hams becoming warm. Sew each ham in a bag and dip this in very thin whitewash. Hang from the rafters for four or five months— If you can wait so long.

When the time comes to cook one of these home-cured hams it should be soaked overnight in cold water to which a few bay leaves have been added. In the morning cover the ham with fresh, cold water and bring to a boil. Boil gently in a covered vessel on the back of the stove allowing twenty minutes to the pound. Allow the ham to cool in the water in which it was boiled. Then remove the skin, spread a mixture of equal parts of brown sugar and vinegar, with a little mustard and red pepper over the fat side, stick it with whole cloves, and return to the oven. Bake for half an hour in a hot oven, basting the ham every five minutes with cider and a very little of the liquor in which it was cooked.

To the glory of the pig, there is nothing of him that cannot be eaten, except the grunt. Of all the foreign peoples who are woven into the texture we call "American," none were more frugal than the German Palatines who settled in Pennsylvania, and are known erroneously as "Pennsylvania Dutch." In Bohemia, and in the Rhinelands, these people had been taught by necessity ways of making a hare go further than one would think possible after it was dead. They had learned to take the portions usually considered inedible and boil these into a broth which they thickened with rye or oaten meal. When cold this could be sliced like a meat.

In Pennsylvania these wanderers found plenty they had never known before. But that did not make them less frugal. After butchering, the women made the sausage, and the blood puddings. Then they took the hog's head and made it into "ponhaws"—doubtless a corruption of the two German words, *pfanne* and *hase* (literally, panned hare). Today this is usually called "scrapple." On the farms it is made in this way:

Halve the head and clean thoroughly, removing the eyes and brains. Put the head into a large kettle and cover it with cold water. Simmer this gently until the meat separates from the bones—several hours.

When cool, skim off the grease, take out the bones, chop the meat and put this back in the broth, season with salt, pepper and sage. Stir in enough coarse corn meal to make a mush and boil slowly for one hour. Take care that it does not scorch.

When cool, pour the ponhaws into greased pans and place in a cool place. To serve, cut it in thin slices and fry crisp and brown.

In Somerset County, Pennsylvania, the Dutch women are even more economical. At butchering they cook all the odd pieces of pig which can't be used in any other way into a pudding—a hard mass of chopped gristle and pork which only a Dutch stomach can digest. It looks like a poor quality of rubber. But the broth from the cooking of these left-overs is thickened with corn meal and buckwheat flour, and this is "ponhaws."

A breakfast of ponhaws and buckwheat cakes, with real maple syrup, is something to remember.

Pork is America's national meat. No other meat appears so frequently on so many tables of rich and poor, and in so many forms. Besides eating it ourselves, we built up a sizable export trade in pork and lard. In 1900, 14 percent of all the pork we raised, and 38 percent of the lard we refined was sold in foreign markets.

With ready markets at home and abroad farmers extended their cornfields, built more sties, and went in for hog and hominy farming. This was especially true in the corn belt where nearly three quarters of all the hogs in the country were raised. A further incentive to this expansion was the number of small packers who started business in the towns in the northern midwest, close to the source of the hog supply. These were usually family businesses, run by one man and his sons. They bought the hogs from the farmers near by, processed them, and resold the meat and lard to the big packers in Chicago, or to retailers in nearer cities and towns. They offered the farmer quick cash for his hogs and a nearby market. They encouraged him to feed his corn to his hogs and let it go to market on its own four feet.

Gradually, under these influences, the northern midwest changed from a grain to a corn-and-hog-raising area.

The small packers—though some of them, like George Hormel, now have businesses valued at many millions of dollars—working with agents of the Bureau of Animal Husbandry, improved the hogs and the conditions under which they were kept and fed. The state fairs and cattle shows helped in this too. Ultimately the little packers and the big ones—like Swift, Armour, etc.—formed an organization called the Institute of American Meat Packers, with a membership of three hundred, and an annual business of three billions of dollars.

Draw an equilateral triangle, and you have a picture of the factors which were represented in the farm and hog situation

of a few years ago. One side of the triangle represents the farmers who raise the hogs and the corn which fattens them; one stands for the packers who process the meat and deliver it to the retail markets; the third is you and me—the public. No side can stand alone. Weaken one, and the other two are insecure.

When the towns are in the throes of a depression, and men are out of work, women try to make a nickel do the work of a dime. They buy less meat, and of the cheaper cuts; or none at all. Immediately the retailers' orders to the packers fall off, and the packers pay the farmers less for the livestock then being driven into the stockyards.

Drought which scorches the standing corn, floods which wash away sprouting fields, winter dust storms which carry off the topsoil which nourishes the surface roots of the corn, all these are immediately reflected in the supply and price of pork at every corner grocery.

The farm situation did not come in with the Democrats. Or with the Republicans. It had begun before Woodrow Wilson declared that a state of war existed between this country and Germany. Since the turn of the century American farmers have been facing the results of their own earlier extraordinary success. The fact that farming in America was profitable drew thousands of immigrants to our farm lands. It encouraged them and the earlier settlers there to plow up more and more acres of prairie sod and to turn grazing lands into corn and wheat fields.

Meanwhile the farmer in the Mississippi River basin was being brought to pay the price of the pulp mills in the north.

These monsters, by gluttonously eating away the forests, were able to spew out the ten million and more sentimental home magazines which jammed the R.F.D. carriers' sacks each month. Actually, American farms have been washed or blown away from under the rocking chairs of readers intent on the love lives of Temple Bailey and Kathleen Norris heroines,

printed on paper which, left in its natural state, would have saved their farms.

None of these events was planned; they just happened. They might have been foreseen; and a few men did foresee them and prophesied. But their prophecies were received about as Jeremiah's were. People just wouldn't, or couldn't, believe that the American soil could be exhausted. Or that overcropping without manuring would invite famine. They treated such warnings with scorn and righteous indignation, as though to foretell these things threatened the great American tradition of inexhaustible wealth and plenty. As though the warners implied that Americans were subject to the same laws that governed other peoples.

So nobody listened to the voices crying of a future wilderness. The people in the towns shrugged and asked what the farmers mattered to them; they bought their food at the A & P. The packers did not see any cause to worry while hogs were plentiful, and there was a market for pork. The farmers replied that there were always good years and bad ones. And the good ones, when they came, made up for the drought and the frost and the floods and the dust storms and the grasshoppers. You had to expect such things when you went to farming.

In 1910, the farmers received \$7.24 per live hundredweight of hog, which, actually, was 59 cents less than the value of the corn which had gone into the making of those hundred pounds of pig. The next year the loss was \$1 per hundred pounds. Alarm began to sweep over the corn belt. The packers pushed the export trade in pork and lard—Germany was buying heavily of the latter. The next two years showed profits, and a great sigh went up from Iowa. Farmers in that state, in Nebraska and in the two Dakotas began to add to their corn acreage.

Then came two years of loss.

The corn crisis was already on one horizon when the Great War broke on the other. World markets for produce acted on the farmers of the corn belt like an injection of vitamin B

into the veins of a man staggering and shaken from alcoholic poisoning. They rode out into their cornlands and plowed more and more acres. Responding to the Food Administration's plea, they bred more and more pigs. In 1918, hogs sold at \$11.73 per live hundredweight, which represented a profit on corn of only one cent less than four dollars. There never had been anything like it in America before.

The next year the profit on hogs was 87 cents less; but nobody thought of complaining. The numbers raised were greater than in any previous year, and exports of pork ran to nearly two million pounds. Germany had stopped buying lard, but the United Kingdom of Great Britain was taking more of this by-product than ever before. Hog-raising looked like the high road to prosperity. Farmers painted their barns and put electricity into them and into their houses. Towns in the corn belt built million-dollar high schools. Farmers' wives turned the pages of mail order catalogs and ordered linoleum, furniture and clothes. They patronized the local beauty shoppes for permanent waves. They got new upper teeth.

Meanwhile the manufacturers in the East took a long look at the corn belt and the prosperity which shone over it, and got an idea. They called in their salesmen for a pep talk. Then they sent them out with orders to sell motor plows, tractors, corn drillers, corn huskers and threshers to the hog raisers.

The glib young men who drove up to the farmers' doors in bright new cars that made the farmers' daughters dream dreams, seemed bent on making the plow horse as extinct as the little cohippus. They showed their motor farm machinery in booths at the state and county fairs.

"Look at the way the world is. All shot to pieces. The farms in Europe can't grow anything for years and years. The world has got to eat, though; and the way I look at it is, you farmers are going to have your hands full feeding it for years and years. Yes, sir, the whole world is looking to the American farmer for help.

"And you've got to have help. Real help. You can't go on

breaking your backs pulling a plow that has a stubborn mule hitched to the other end of it. The world can't wait for mules and horses any more. They're too slow. Speed's the thing, today. Speed's cheaper, too. Your time's worth dollars, isn't it? Modern farm machinery lets you get your work done in half the time. And you've got some time to live in. Time to spend with your family enjoying yourselves. Life oughtn't to be all work; it ought to have some play in it.

"Listen, farmers, the farm has got to have motor power. You ought to have tractors like that fellow Thomas Campbell uses out in Hardin, Montana, where he's growing wheat the way the United States Steel Corporation makes steel. . . ."

With the money from their hogs they bought tractors. And corn drillers and corn huskers. They bought large motor trucks, useful to carry hogs to the stockyards, and corn to the elevators. They did not foresee that their sons would soon find it easier to use the truck to haul fodder to mules in pasture than to harness up those mules and make them haul their own feed.

In 1921, the price of hogs collapsed. The market was glutted. And, incredible as it seemed, it went on falling. There was a loss of 83 cents on every live hundredweight in 1920. In 1933 the loss was \$4.28.

Twelve years in the red. Twelve years when it cost more to raise corn than pigs were worth. Twelve years while motor power reduced the number of horses and mules which had eaten part of the corn raised. Twelve years meeting installments on plows and tractors; paying for gasoline to run these; paying for commercial fertilizers. Farms that had never had a mortgage on them were put up at the banks to pay for aids to prosperity which had failed to bring prosperity.

Between 1920 and 1933 one farm in four in this country was sold for debt or taxes. Tenancies increased by more than two hundred thousand. The value of farm property declined by \$20,000,000 in the first ten years after the War. In the next three years it was to drop lower, until the value in 1933 was 57 percent of the pre-war worth.

Nobody knew what to do about it. The export trade in pork had fallen off badly, due to Denmark's raising hogs for the British market and the efforts of all the European countries to re-establish their farmers. Germany returned as a customer for lard and boomed this market for us in 1923. But there, too, the effort was being made to raise lard at home. A few years later the tariff on foreign lard was raised from \$1 per hundred pounds to \$17. This cut off the market in Germany. Mexico, another good customer for lard, began to talk tariffs.

Where was American corn going to go, if not into hogs? And if into hogs, then who was going to buy them? The entire agrarian scheme of the country was broken down. It was as stalled as the power cultivator standing in Farmer Walt Jaycox's shed. He kicked the front wheel disgustedly.

"Look at the durn thing. It's as bad as Lonny Brewer—won't work lessen you fill it plumb full of firewater. Only Lonny'll drink corn likker. This contraption has got to have gasoline. And it hasn't given me a spadeful of manure since I got it."

The farm situation was waiting for Calvin Coolidge when he walked into the White House after Harding's death. But the ex-Governor of Massachusetts, who said "the man who builds a factory builds a temple," frankly considered the manufacturers of the country of greater value to its development than the farmers. It was the old story all over again; industrialized New England against the agrarian midwest.

Once again the fight was on between the white milled loaves and the strong yellow bread of the frontier.

Congressmen from the corn belt stormed Congress for relief for their constituents. The result was the McNary-Haugen Bill which the House passed, and the President vetoed. A second time the House passed it, and again the man from Massachusetts used his power to say "No." Farm relief was shelved for the time being. And farm prices sank lower.

As though to force the farm crisis on the country, the weather now took a hand. There were three years of drought and con-

sequent dust storms, following springs in which the snows in the north melted too suddenly for the rivers to carry them off. Corn withered in the dry summers, and stock, without pasture or water, died. Millions of dollars' worth of topsoil was washed down the Mississippi as once the produce raised on that soil had been floated. In Oklahoma, starving sharecroppers looked at the stunted cotton and blasted corn and knew they were licked. Farmers in the northern midwest besieged the banks for loans and were turned down. Cornlands weren't worth lending money on.

There were men, like Farmer Summy, who came through those years. They came through chiefly because they had kept their heads in the years of rapid farm expansion. They had steadfastly refused to farm against the future. But most of them grew gray holding their own and seeing their neighbors go to the wall.

The Secretary of Agriculture had figured largely in the framing of the McNary-Haugen Bill which was planned to allow the Government to set prices for farm produce and to control production. When, during the first Roosevelt administration, Congress passed the Agricultural Adjustment Act, this conferred on the Secretary of Agriculture extraordinary power to bring about farm relief. The lines taken by Secretary Wallace were those suggested in the bill which Coolidge had defeated.

The relief measures—briefly, paying farmers not to plant a certain acreage of certain crops, or to raise more than a certain number of cattle, hogs and poultry—startled the country.

The idea of cutting down the nation's food supply at a time when the bread-lines in every city were lengthening filled people with horror. Where was the economy in that? What had happened to the machinery of production that it could not move the surplus from the farms to the hungry towns? And what became of the consumer's dollar that so little of it reached the men who raised the commodities for which the dollar was paid?

But one million farmers signed the contracts which the A.A.A. offered them. They would have signed anything that offered even hope of relief. The contracts covered seven basic commodities: wheat, tobacco, cotton, milk and milk products, cattle and poultry, corn, hogs. The contracts covering the last two of these called for a reduction of 20 percent in the acreage of corn grown, and a 25 percent reduction of hogs.

It was estimated that the 45,000,000 hogs—the average number slaughtered annually under Federal inspection during the previous ten-year period—would be reduced to 38,000,000 in 1937. Actually, the farmers bettered their contracts by one million hogs.

These were the eight million pigs which squealed in the Senate and the Supreme Court. Eight million pigs which did not exist. Meanwhile, pork prices were the highest they had been in years. Bacon and ham went off the nation's breakfast tables. Lard substitutes—made of vegetable oils—were bought in place of high-priced lard. Pork, which had always been the working man's food, was beyond his wages or relief check.

One interesting consequence of the pork shortage, according to William Whitfield Woods, President of the Institute of American Meat Packers, was that Americans began to eat fish. Chain stores installed fish and vegetable counters. In one district where no fish had ever been sold before, a chain of stores advertised skinned whiting at ten cents the pound, and sold one hundred thousand pounds in a week.

It was the meat packers who brought to court the case against the A.A.A. They were being squeezed between the upper and the nether millstones. They could not get the pork and lard to fill their orders from abroad, and their business was severely menaced by the importation into this country of foreign hog products to meet the sudden shortage here. To show how these importations followed the A.A.A.'s restriction of American corn- and hog-raising, one has only to examine the figures for 1933 and 1935.

IMPORTATIONS INTO THE U.S.A.

1933		1935
o	Hogs	100,000
o	Corn (lbs.)	1,200,000,000
50,000	Cattle	250,000
o	Tallow (lbs.)	200,000,000

Foreign corn- and hog-raisers and foreign processors were getting rich on the American market, while American packers were paying process taxes to the government to be used to pay farmers not to raise crops.

The Supreme Court's decision that the extraordinary powers granted to the Secretary of Agriculture under the A.A.A. were illegal, and that this government could not legally prohibit the production of food, was the triumph of those eight million hogs which never went to market.

We are still too close to the crisis to judge of the effectiveness of the A.A.A.'s program of farm relief. Nobody knows what it has done for the corn belt.

Farmers are going back to raising corn and hogs, or not raising them, according to their own judgment of the markets for these. From October 1939 to June 1940 the hogs slaughtered under Federal inspection numbered 34,332,746. Many farmers are making use of the opportunity the government offers them to put their corn in bond. But all of them are wary of extending their corn acreage. Many are letting fields go back to grass for grazing.

One result has been the increase in subsistence farms in the eastern states. By applying scientific methods to the cultivation of outworn New England fields, the yield of corn per acre in Connecticut during 1939 was ahead of that of Ohio, and nearly equal to the average yield of an acre of Illinois or Iowa cornland. Too, farmers in the South have gone in for hog-raising. Whereas formerly, 73 percent of the hogs in the

country were in the corn belt, now the numbers in those states represent only 60 percent of our national pork supply.

The horse and the mule are coming back to the farms. Events have proved that these are not so outmoded as the enthusiastic young salesmen for General Motors once said they were. Horses and mules will work on corn. There's a lot of work on a farm that is done more cheaply by animal power than by gasoline.

The squeals of those eight million pigs woke up the entire nation to the necessity for forest and soil conservation; and for drought and flood control measures in the Great Valley which is America's market basket. Even the unthinking ones who "always bought their food from the A & P" were made aware of the source of supply behind the counters and shelves in the corner groceries. They know now that that source must be protected if Americans are going to have enough to eat.

Not least of all, those eight million pigs set a lot of us to thinking. They made it fairly apparent that Nature's economics take no account of man's. You can't contract against drought or flood or frost. The laws of natural increase and supply don't respond to factory methods of production, or the theories of the technocrats. From now on, it is safe to say, we are going to be wary of throwing a political monkey wrench into Nature's machinery.

And if, by the generous laws of Nature, our corn and our swine increase, we'll let 'em. We'll lean on the fence rails and rejoice in the fatness of the land. Some we'll take to market; and the rest we'll eat, thankful for a good dinner table. And if we have enough over to give to the man who has none, the national economy will not be upset.

Who knows, the time may come when America won't have a single hungry person in it!



X

The Mills Grind Slowly

THE Maya who planted the first corn used a *metate*-stone on which to roll the kernels, which were first soaked in warm lye water. The stone was as important to every family as its hearth. Its place was outside the house door. The time spent on one's knees at this humble altar was not without compensation in the way of a knowledge of how all the other villagers were conducting their affairs. In every Mexican village today the *metate* is in evidence. Stuart Chase tells the story of a lady living in the capital, who took her Indian cook to see the relics of ancient Toltec civilization which have been excavated from the lava flow at San Angel. The Indian woman was quite unmoved until her eye fell on a prehistoric *metate* stone. "She was enchanted with its shape, and implored the mistress to secure it for her kitchen. 'The *metate* I've been looking for. Ah, if I only had it! Such beautiful little tortillas as I could make you.' That stone was used by some pre-Aztec woman, overwhelmed by a volcanic eruption two thousand or more years ago. The maize tradition does not die."

Where or how the saddle-stone was evolved is unknown. It was the household mill of the Egyptians, and is pictured in papyri and wall paintings. Among the score and more objects buried with the mummy of the Prince-Chancellor Meket-Ra, steward to one of the Pharaohs of the eleventh dynasty, and excavated from the royal cemetery at Thebes, are models in wood, realistically carved and painted, of many of the prince's earthly possessions.* These include a granary, a bakery and a brewery, besides stables, gardens, boats, palaces. Within the

* In the Egyptian Collection, Metropolitan Museum of Art, New York.

granary a clerk keeps record of the sacks of grain which slaves carry on their backs up a flight of steps to dump into the bins. In the brewery, male slaves pound the mash, or tramp it with their feet. In the bakery, other male slaves under the direction of an overseer mix and knead the loaves preparatory to placing them in the waiting ovens. The only female figures in these models, which preserve a faithful record of activities some four thousand years ago, are two women kneeling at saddle-stones within the bakery. They are grinding the flour for the use of the men bakers.

The saddle-stones used in Prince Meket-Ra's bakery are identical with many seen in Mexican villages today, or in the Indian pueblos of our southwest. Like all that have been found in countries east of the Atlantic, they are simply fashioned and without ornamentation of any kind. But every important collection of Mayan and Aztec objects has a number of *metates* sculptured in the form of dragons or frogs—symbols connected with rain-making ceremonies for the fertility of the fields. Others carry the snakes of Coatlicue, the Earth Mother. Not infrequently the snakes have seven rattles to commemorate one aspect of the goddess, "Woman of the Seven Snakes." These present us, too, with an American version of the rain-rattles that were shaken before Ishtar, Isis, Cybele and all other earth and grain deities.

With the American tribes the *metate* and the mortar, either of stone or of wood, remained the only form of mill until the Europeans brought the idea of using water or wind to turn grinding stones. The *metate* seems not to have crossed the Great Plains and the Mississippi to the Atlantic littoral. Squanto taught the men of Plymouth how to make beech and oaken mortars in which the first corn harvest was pounded into meal. The rhythmic thump-thump of the heavy pestles on the wood resounded throughout Plymouth until, in 1623, the Council authorized "a water-work to beat corn, not to interfere with the intending gristing-mill." The toll, fixed by the Council, was "one pottle per bushel."

Primitive America never had the quern, the bridge between the saddle-stone and the rotary grist mill. The quern was truly a mill. It was composed of two stones; the lower was stationary, and the upper turned around on it by means of a stick thrust into a hole near the edge. The grain was poured by hand into a hole in the center of the upper stone. The principle was exactly that of the later grist mills. In fact, the Romans called a quern *mola*, from which the word mill is derived.

In the most primitive querns, which date from some time in the second century B.C., the lower stone, or bedder, was a rock selected for its conical shape which allowed the ground meal to run down the sides. Only the tedder (upper stone) was quarried. Later, quarried and dressed stones were used for bedders and tedders.

The quern was essentially a part of the kitchen equipment. The milling was done by the "lady" of the house, or by a female slave. In poor villages there might be one quern for the use of several families; but not a man of the village would have demeaned his manhood by setting hand to the wooden handle of the tedder.

These hand mills were used by all the peoples of the Mediterranean littoral. Besides these, and the more ancient saddle-stones, the Egyptians had had paddle mills. These were boats, moored in mid-stream, in which a large quern was set up. The current turned the paddles, which turned a shaft connected with the upper stone. Perhaps from these the Romans got their idea of a water mill. Pliny mentions one—and as though it were a rarity in his time. The Romans took their invention to the Rhineland, where they had discovered a quarry from which to cut excellent millstones; to the Rhone, to the Seine, and to the Thames. They took corn-grinding out of the home and out of the hands of women. They turned it into a business—a business for men.

For a long time the women of that loosely jointed empire rebelled against this intrusion on their ancient rights and

duties. They roundly resented such totalitarian ideas, and refused to take their grain to the mill where the miller—a government man, and therefore no more popular than an excise-man in the Kentucky mountains—exacted a heavy toll of the meal ground. No doubt their husbands tried hard to explain the political and social advantages of this new economy. The women simply would not, or could not, see things that way. Why, they asked, should they pay the state to do for them what they were able and willing to do for themselves?

“Think of the legions,” their husbands replied. “Think of the magnificent new buildings they are putting up in Rome. All that takes money. Think of the wars. It costs money to make a war.”

“But why have any wars?” the answer came back.

Ultimately, of course, the state and the men had their way. At least to the extent that the Emperor Constantine issued an edict forbidding the use of querns in localities where there was a water mill. The state had to be supported, and progress had to go on, whether women understood the one or wished the other. Men knew that so long as you left an industry in the hands of women and in the home you couldn’t exploit it or tax it or monopolize it. Perhaps they argued that you had to raise it to the level of a business and put men in charge of it, to turn it into a problem. Then it became important.

So the mills were built on the streams all over England. A number of them, including one run by tidewater, are mentioned in Domesday Book. Meanwhile, however, women continued to use their mothers’ and grandmothers’ querns, and to cheat the government. There’s a stretch of lonely, rocky moorland in Lancashire still known as “Quern Moor.”

But the dignity had been taken from the task of corn-grinding. The Code of Ethelbert, written about the middle of the sixth century, decrees: “If anyone molest a maid servant of the king he shall pay 50 shillings amends. Of if she be the maid who grinds at the mill, he shall pay 25 shillings.”

The Norman barons, bishops and abbots were inheritors of

the Roman point of view. They believed in organization. As Big Business men, they quickly set up more mills and commanded their vassals and tenants to bring their grain there to be ground. One abbot, to insure the use of his mill by the farmers, sent soldiery to carry away the household querns. He used them to pave his parlor. Some years later, when his reverence put up the price of corn-grinding, the people marched on the monastery armed with pick-axes and hoicked the quern stones up from under the quaking abbot's feet.

The miller was a baron's man. Or a bishop's, which was slightly worse. The farmer knew he couldn't trust him; a surly, crafty fellow who held his job on a pledge to his master to weigh short.

This character of the miller persists through so many old tales and ballads that it has become one of our literary traditions. Just as all carpenters are proverbially simple-minded and good, and tinkers a bad lot. Chaucer's miller is drawn after this pattern. The design is inescapable now. Let a story-teller introduce as a character an honest, generous, warm-hearted miller: his audience will have none of him.

But who has ever read or heard sung of a miller's daughter who was not young and beautiful and trustingly frail? She allows the young stranger to woo her by the purling mill-stream while her father is safely inside, grinding the lover's corn. At the close of the third stanza the lover rides away, never to return. The miller's daughter lingers through another verse or two, only to die of a broken heart and leave her parent surlier and more crotchety than before, at the end of the song.

The old water wheels were usually fitted with overshot wheels. The stream was dammed above the mill, and a head of water was carried from the pond through a stone or wooden head-race to a sluice set directly above the wheel. When the sluice was opened, the water fell into the pockets which formed the wheel's rim. The wheel was forced down and around by the weight of water it carried. The pockets emptied at the bottom and, lightened, came up to be refilled at the sluice and

so forced down again. The wheel's turning turned a shaft which entered the side of the mill and joined the tedder which it caused to revolve. An undershot wheel is planned to be turned by the current of the stream in which it rests. Naturally its usefulness is affected by seasons of high or low water. Nor can an undershot wheel be used in streams where the current runs at a distance from the shore.

The principle of the windmill is that of the screw-driven ship. The sails, made of light wooden lattice, are fitted with canvas louvers. These permit of being opened so that the wind may blow through, leaving the mill at rest. When closed, they offer resistance to the wind which forces them around. The veering sails revolve a shaft which turns the upper millstone inside the windmill.

The problem of how to keep the sails in the constantly changing wind was solved by building the early mills on stout wooden posts. The post was fixed securely to the ground, but a wooden bearing atop this permitted the heavy superstructure which was the mill-house, to be swung round, thus bringing the sails into the prevailing wind. Later on, engineers devised a way of building towers with the mills high up in them. A wooden cap on the tower revolved on a large bearing. The sails were fastened to the cap. Many of the windmills still turning in the Netherlands are of this design. In England, where the wooden facing of the towers was frequently painted white, they were called "smock mills."

Recently a man digging on the site of an old mill pond near Orangeburg, South Carolina, discovered a set of mill gears made of southern oak which, according to Professor B. W. Dedrick of State College, Pennsylvania, an authority on old American mills, "may be the oldest pieces of machinery in America."

Do these gears which are apparently parts of three separate mill wheels (the largest nineteen feet in circumference) solve the mystery of the "lost colony" which left Roanoke Island

and wandered south to Croatoan? There are no records or legends of a mill in that locality. Experts have given their opinion that the gears had been buried at least two hundred years. One has a bullet embedded in it. There is the possibility that the Roanoke settlers set up the mill there and that shortly afterward most of them, or all, were killed by savages.

The first mill of which there are records is the windmill which Sir George Yeardley put up about 1620 on his patent Flower de Hundred on the James. A spit of land reaching into the river is still called Windmill Point. The spot has another historical significance, for it was here that Grant's army crossed the river, one hundred and thirty thousand strong.

Mills, driven by wind or water, soon became common in the Tidewater. Every large estate had its own mill to grind the corn harvest. The mill at Stratford, the historic home of the Lees, has been reconstructed in recent years.

The first grist mill in Massachusetts was built at Watertown and was owned in part by William Cradock. His half interest was valued at £200. Occasionally this is spoken of as a tide-water mill, but one writer says it was found necessary, in 1632, to move the mill to Boston because at Watertown it was impossible to grind corn except when the wind was westerly. Which seems to indicate that this too was a windmill.

A well-watered land, Massachusetts soon had a mill turning in every settlement. The noble Sir Richard Saltonstall was miller at Ipswich and charged a toll of one-sixteenth of the grain brought him to be ground. Frequently, mills were built at common expense. The Plymouth records give a court order, dated 1634, providing "that Stephen Deane have a sufficient water wheele set up at the charge of the colony, consisting of one foot more depth than he now useth; the said Stephen Deane finding the iron worke thereunto belonging." At Stamford, Connecticut, a dam was built by the townsmen; the frame and body were put up by a carpenter for £51, and the town sold the mill for £75. Many of the early mills in New England are still standing, like that of Governor John Win-

throp at New London. Some are still used as corn mills, others have been incorporated in the small factories which make the rivers of New England the busiest waters in the world.

Isolated settlers devised a sweep-mortar, made of a hollowed tree-stump and a convenient sapling to whose top the wooden pestle was affixed. Jerks on a rope worked the pestle and sent loud thumps reverberating through the woods. These sweep-mortars were so common on Long Island that sailors, lost in a fog on the Sound, listened for the sound of them as a warning.

The Dutch patroons on their Hudson River patents built mills on all the little kills. It was a sawmill—"de Zaagaertje"—which gave its name, onomatopoeically, to Saugerties.

One pair, at least, of the three sets of gristing-stones which the *Fauna* brought to the Fort on The Rocks in 1644, went into the mill which the Swedes built on the creek they called "Sköldpaddekill" (Turtle Creek) which flows into the Brandywine at its confluence with the Delaware. This is now within the limits of the city of Wilmington. That mill continued in operation for more than two centuries. No doubt Dutch Molly, the hominy-seller of Wilmington and who probably was Swedish, got her supplies there. She was a famous figure in the town; a hawker who might have stepped from a Hogarth print, fat and blowsy, with a wink for a likely looking lad, and a bawdy jest on the tip of her tongue. Decorous Wilmington housewives spoke of her as "that dreadful woman," and shuddered when her hoarse cry, "Hot corn! Hot corn! 'Ere's yer lily-white hot corn!" sounded under their windows. But they sent the servant out with a bowl and a coin for Molly's wares, nevertheless.

Millstones were part of the cargo of every ship coming to the colonies. Most of these were quarried in France, from buhrstone, a silicious quartz found in the Eocene formation of the Paris basin. The Romans had gone to Andernach on the Rhine for their millstones, and in England the stone-cutting works of Notts and Sussex were listed among the country's

assets by the compilers of Domesday Book. Anglesea, too, supplied medieval mills with grist-stones. But for many centuries European mills had been supplied from Houlbec, near Evreux, and from the still larger and more famous quarries of La Ferté-sous-Jouarre, which lie close to Château-Thierry. Trains carrying American troops to that sector in July and August 1918, were run up on the tracks of the quarry from which came most of the stones that ground American corn meal.

Stones for the mealing trade were cut from three to seven feet in diameter, and twelve inches in thickness. Many of the smaller stones were quarried in one solid piece, but the larger ones, and the majority of those brought to America, were cut in four to nine segments. These were mortised together and bound with an iron rim. The bedder was finished smooth. The tedder's inner surface was cut in a design which hastened the grinding process and helped to work the meal out to the edge to fall into the bin. Stones used for grinding wheat or rye required less cutting than stones used for grinding American corn. Here and there, in Europe, are still to be seen ancient gristing-stones carved with religious symbols and names. But usually the design was a simple arrangement of grooves, like the spokes of a wheel. An old buhrstone is sunk in the soft grass in front of the little red mill at Ludingtonville, Putnam County, New York. The stone is nearly snow white. The design, like the fronds of ferns, swirls away from a central opening which is shaped like a Celtic cross.

This mill was the property of Colonel Henry Ludington, who headed the Dutchess County militia. From it, his daughter Sibyl rode on horseback on the night of April 27, 1777, to summon the members of her father's company from the cabins in the Big Woods and the valley farms, to meet the British at Danbury.

Hundreds of old millstones have gone to make doorsteps and to pave terraces and garden walks. There is such a walk on St. Helena's Island, near Beaufort, South Carolina, and an-

other in a garden close to Albany, New York. John Taylor Arms is a collector of millstones in his Connecticut garden.

South Carolina, so its sons boast, is the best-watered state on the Atlantic seaboard. It is also a state of old mills. Many, like the one in Middleton Gardens, ground rice, but all of them ground corn which was and still is the state's chief cereal food. The old Bluff, or Cornwallis Road, running west to the mountains and over them, passes a score of old mills, many of which are still in operation. One, in the city of Columbia, was built prior to 1740. General Sherman set fire to it on his march to Georgia. The present owner rebuilt the ruin, dug the old French buhrstones out of the brook, and set up a wheel again for the grinding of corn.

In all the mills it was usual to use stones of American granite to grind corn for cattle and poultry feed. Granite was supposed to make a smooth meal, and buhrstone a meal with round particles. Most old mills were furnished with both types of stone. A very large one, of Vermont granite, which served in the Yellow Mill at Bridgeport, Connecticut, is now part of the equipment of Rose Mill at Milford, near by. Very early in colonial days the German Palatines who settled near New Paltz, New York, began quarrying in the Shawangunk Mountains. They did quite a trade in millstones from the granite along Esopus Creek.

When the stones were in constant use—most country mills ran steadily from November to April—it was necessary to lift the tedder every two or three weeks and spend a day or two dressing the surface. Moving the stone was no easy task in itself, and cutting it called for skill and proper tools, which in most instances the miller had to make for himself. No ordinary chisel would carve the excessively hard buhrstone.

At Jennerstown, in Somerset County, Pennsylvania, a summer theater has been made out of an old grist mill. It was built, early in the last century, of heavy chestnut logs and chinked with plaster. Originally the mill stood at Roxbury, some miles from its present site. At the time of building an

order was sent to France for a set of grinding stones. These were cut and shipped to Baltimore, and then reshipped by canal to Cumberland, Maryland. There they waited for winter to come and cover the mountain roads with snow. Then Miller Reitz yoked eight oxen to a sledge and went over the ridge and down to Cumberland to fetch the stones to his mill. On the return trip, while high in the mountains, the sledge-runner struck a buried rock. Over went the sledge and over went the millstones, crashing down the mountainside. For twelve months more the mill and the farmers waited until another set could be quarried and sent from La Ferté to Cumberland and brought—safely, this time—across the mountains. These now hang on the walls of the theater, after nearly one hundred years' service to Somerset County farmers.

In selecting a site for a settlement it was necessary to look for a body of water which could be made to turn a wheel. The difficulty of carrying corn to a distant village to be ground was insurmountable with few draught animals and fewer—and these bad—roads. The early records of Eastchester, one of the first villages in Westchester County, New York, give the agreement made by the thirteen original settlers in 1665. Article Twenty-one provides “that one day every spring be improved for the destroieng of rattellsnacks.”

That there were plenty of these creatures seems apparent from the name “Rattellsnack Creek” on which the first mill was built by John Jackson. Perhaps the rattlers drove John out, for a few years later we read of the settlers making overtures to John Taylor of Woodbridge to come and be their miller. This John, too, may have had a healthy dislike for the wriggling symbols of Coatlicue. He had to be urged!

Ultimately an agreement was drawn up between him and the council which the Town Clerk—whose spelling suggests that it was he who produced those ominous “rattellsnacks”—called “A covenant consernin keepin the mill and grinding our corne.” By its terms the town set apart three acres of upland and two of meadow for

. . . this smith who agrees to grind the corn which comes first to the mill, and in scarcity of water to grind ondy for the inhabitants of East Chester, for the sixteenth part towell of wheat, and the twelfth parte Indian corne; and to pay £28 at or before the 25th. day of December next.

Covenants of this sort were not at all uncommon in the northern colonies where a simple democracy prevailed. The close interdependence of farmers and millers was too clearly recognized to be lightly treated. In a very real sense the miller was a public servant. He ranked below the schoolmaster, but was not to be classed with the blacksmith, house builder or wheelwright. The rate charged for grinding corn was fixed by the Town Council. The miller could show no preference in the way of grinding one man's grain before another's. The miller served the community impersonally, not for cash, but for a toll. This gave his service an unquestioned dignity.

The road to the mill was the most traveled one in the township. It was the first to be broken after a heavy snowfall; the first to be improved when the Selectmen called on the men to give a day's labor on the highways. The mill itself was the general gathering place for the men of the community; older than the church, freer, more democratic, infinitely more comfortable. A man could rest himself on a sack of corn and speak his mind about the government. He could spit satisfyingly into the mill-race while he argued with a farmer from the other side of the ridge the probable results of the coming elections and the advisability of bringing the need of a new bridge over the Housatonic before the Selectmen's Meeting.

News came to the mills, and went from them to the farthest hillside cabin. . . . Ben Holmes had heard it said in Boston by a ship's captain newly come from Malaga, that the English were landing soldiers in Spain. . . . Queen Anne was poorly. . . . Would her successor be the Pretender, or some German princeling? And what would either one of these do for the colonies? . . . Wheat was six shillings and sixpence the bushel. . . . The New Haven bakers, to meet the house-

wives' demand for a Penny Loaf, were making three sorts of bread for the price; a white loaf that weighed six ounces; a whole-wheat loaf of nine and one half ounces weight; and a generous, twelve-and-one-quarter-ounce Household Loaf, of whole-wheat and rye and corn. . . . There was a man and a family with not a word of English to their tongues building a cabin over in Coon Hollow. . . . A peddler on his way back from the Carolinas reported that the planters down that way were growing mulberry trees to feed to silkworms—"expect to make money at it, too." And Elijah Griffin had stopped by that morning to tell the miller to let folks know he'd caught a pair of dirty-looking Indians hanging round his wood-lot. "'Lije's got his eye and his musket on 'em. But best tell your women folks not to go berryin' for a couple o' days."

The work which the Romans began had succeeded. The mill was a man's world. No woman set foot in it. If a bare-legged girl in a sunbonnet rode up to the door with sixty pounds of corn in a sack slung over her horse for a saddle, she waited shyly outside while the grinding was done.

Meanwhile, inside the dim, dusty-raftered barn there were the sacks of corn piled and waiting to be ground; there was the pleasant creak of the big wheel outside, and the rumbling of the brook under the flooring; there was the sweet smell of the pale yellow meal running out from under the steadily turning tedder into the bin.



XI

The Mills Become Towns

IN THE dull little princely town of Hesse, Christopher Ludwick held the post of court baker. His pudgy fingers mixed and kneaded dough for the rolls which the Prince nibbled each morning with his chocolate. He iced the ten-tiered cakes for the royal weddings. Using a secret recipe of his own, he made the gilded gingerbread angels which hung on the little princesses' Christmas trees. The Princess, who was herself the daughter of the King of England, regularly praised the excellence of his almond paste.

A happy man, Christopher Ludwick, but for one thing.

That was his son, another Christopher. The baker frequently sighed and shook his head over him. It wasn't as if the lad were a *dummkopf*. Ach, nein! Any man would know what to do with one of those; put him into the army, and let the Prince pay for his blunders. No, Christopher was bright and enterprising enough to be a baker. But he wouldn't be a baker. That was the trouble. He obstinately refused to be taught the secrets of the kitchen and the ovens. He was not even interested in the famous Ludwick gingerbread, the recipe for which his father promised to impart to him the very day he completed his apprenticeship.

Instead, Christopher declared that he wanted to see the world. To travel, as though he were a gentleman. He was itching with curiosity about other countries—as though Hesse were not sufficient for any reasonable man. He said he wanted to see queer, outlandish places like China and Africa and the English colonies in America.

If the Prince had kept a navy, his court baker would have

turned his son over to it with a happy heart. There being none, and his father's insistence that he join him in the bakeshop growing every day, young Christopher ran away to London, and shipped in an English vessel to see the world.

He had had a fair view of it before his father died, leaving him a tidy little fortune. He went to Hesse to collect it, to sell the bakeshop and to strut his freedom before the envious eyes of his old companions. Then he went to London and set himself to the pleasant task of spending his money. There was no lack of Germans in that city of which George the Second was king. Christopher had friends to help him in his spending. When all but twenty-five pounds of his patrimony was gone, he shook himself hard, called himself a variety of names in five languages, invested the twenty-five pounds in some ready-made clothing and a peddler's pack, and sailed to Philadelphia.

So began the career of the man whom Congress appointed Superintendent of bakers for the Continental Army, whom Washington called affectionately "old gentleman," and "my honest friend." He was to wield a power over the colonial mills and millers that made him a public official to be respected and obeyed.

It was in 1753 that Christopher Ludwick had his first sight of an American city. He managed to see a good deal of it, and of the country round about while increasing his capital to one hundred pounds. He made up his mind to stay there. But first he went back to London where he hunted out a baker who had learned his trade under Christopher's father in Hesse. Christopher apprenticed himself to him. He gave two years to learning all the arts of mixing and icing which he had refused to learn in Hesse. Especially, he learned the secret of the famous Ludwick gingerbread. Then he came back to the colonies and set himself up in his father's trade.

Ludwick's bakeshop was famous in pre-Revolutionary Philadelphia. The Quaker aristocracy ate his gingerbread, his almond cakes and marzipan and signified their approval. The Schermerhorns and Rittenhouses told each other that never

had any of them tasted anything more delicious. They ordered cakes from Christopher Ludwick for all their parties.

Within ten years the baker had piled up a fortune which more than equaled that which his father had left him. He had nine houses in the city and a farm at Germantown, and thirty-five hundred pounds in the bank, when a number of grave-looking gentlemen began to arrive in Philadelphia from all of the colonies and went into session in the city hall. The atmosphere in the city grew tense; rumors went round. Would the delegates dare to oppose His Majesty's laws? Could the colonies exist as a free and independent nation?

In those last days of June 1775, the heat in Philadelphia was intense. But none of the well-to-do families left the city for their country homes. They stayed on, waiting on tenterhooks for the decision which the delegates should make. And meanwhile Christopher Ludwick baked his loaves of bread, and his cakes and his gingerbread to be eaten by men and women who talked anxiously of the future. "If it comes to war . . ."

"If it comes to war . . ." thought the baker. And with instinctive German thrift he set about securing a supply of flour to be stored in his cellars. He went about buying wheat and corn before the prices should go up. He bargained with farmers for that fall's harvest. War meant men leaving the fields to fight. It meant increased demands for food. If England sent an army to quell the threatening revolution, that army would require to be fed.

The bell in the city hall began to peal. It was the signal the city had been waiting for. "Freedom . . ." "An independent nation . . ." "And now, for a certainty there will be war. . . ."

Men who had been waiting with horses ready saddled to ride with the news to Richmond and to Boston and to New York set spurs to their mounts and galloped over the bridges, away. Quaker merchants came home from their counting offices and told their wives to have the doors and windows locked and barred, and to buy supplies for a long emergency.

The officers of the militia called their men and commandeered rations. Up went the price of wheat—up went the price of corn. Farmers stationed their sons beside the green fields of growing grain to protect the crops.

A plump little man in a pair of nankeen breeches and a blue coat with shining silver buttons—a little man who looked not unlike the caricatures of King George III which were set up all over the city, appeared at militia headquarters.

“Mr. Christopher Ludwick to see the commanding officer.”

The officer knew the name. Too, the Governor of Laetitia Court was a well-known figure in the city. He was shown in to the Colonel at once.

What Mr. Christopher Ludwick had come to do was to turn over his supply of flour and grain, and his bake-ovens, to the use of the Continental Army. He had come, too, to offer his own services. Not as a soldier—for that he was too old and too corpulent. No, but as a baker. There was no one in the colonies, he ventured to say without boasting, better skilled than he in the trade. No one who could get more out of a pound of flour than he. No one with more cleverness in substituting corn meal for costly wheat flour, and molasses for sugar. Let him bake for the army, and the troops could be sure of good bread.

So Christopher Ludwick served the cause of a free America in a white apron and cap. He marshaled his cooks and he measured out the supplies to them, keeping sharp watch of every ounce. When the flour and the grain he had bought were gone, he used his own money to buy more. He mounted his fat pony—looking more than ever like King George—and rode to the mills round about Philadelphia. There he over-saw the grinding of the army’s corn.

Each miller has his own way of grinding corn meal. Some of them crack the corn first before feeding it into the tedder. Some of them leave the stones far apart, making a coarse meal. Others tighten the stones, and grind the kernels into a meal only slightly rougher than a flour.

"Give me as fine a meal as you can grind," Christopher Ludwick told the millers. "I'll bake bread with that corn that the men won't know from wheat; except that they'll get more fighting strength out of it."

And then he watched that the millers took no toll of the army's grain. "Every kernel in those sacks has got to go to feed a soldier. An army can't fight without food. The farmers have got to raise the corn, you millers have got to grind it, I and my men will make it into bread. That's the way the colonies will win. It's the only way."

The city of Philadelphia remembers Christopher Ludwick for what he did for his fellow townsmen during the yellow fever epidemic fifteen years after the war; and for his bequest to the poor children of the city. The army remembers him for his cleverness in going as a spy to the Hessian camps. He peddled his famous gingerbread to the soldiers, and brought back news. Moreover, he persuaded more than one Hessian to desert his regiment and accept the Continental Congress's offer of fifty acres of good farm land and American citizenship.

"Better be an American farmer, and free," the gingerbread peddler counseled, "than to lose your lives fighting for a cause that is not yours; and for a king you never saw."

But not the least of the little baker's services to his chosen country was his work before the ovens and at the grist mills. He had a jealous concern for every bushel of corn the army bought.

"Give me the corn, sir," he said to Washington, "and your troops will be fed. Not a toddick of it but goes into a loaf. As long as there's a farmer left to plant corn we'll keep the army in the field."

There are mills in this country which "Baker-General" Ludwick may well have visited, and which are still grinding corn. One, not far from Valley Forge, ran until a very few years ago. A sign in front of the old stone building tells that it served the Continental Army.

At Milford, Connecticut, not half a mile off the Boston Post Road, stands the Rose Mill. For two hundred and thirty-three years, Fairfield County farmers have been bringing their rye, buckwheat and corn there to be ground. When the old Post Road became a wide, concrete highway, crowded with motor traffic and lined with hot dog stands, shore dinner restaurants, gas stations and booths for the sale of garden pottery, evergreens, toy windmills, maple sugar hearts, Mexican glass and sweet corn in season, many people thought the need for the old mill was over. They said the "summer people" were pushing the farmers out of the county. Summer people didn't farm. They let the cornfields go to daisies and ragweed, and called it picturesque. Was it likely that a speed-crazed generation would wait for water power to turn buhrstones to grind grain? Not when they could hop into their cars and ride to Bridgeport and buy package goods at the chain stores. "Folks want their things in cellophane, nowadays."

But the Rose Mill continued to grind. It was a New York business man who saw its possibilities and bought it and the old white house beside the millpond from the miller, who had been there nearly seventy years. And it was an enterprising, modern woman, living in Fairfield, who conceived the idea that people might like to buy bread which tasted home-made, and which was made from flour ground at a historic, colonial mill. Pepperidge Farm Bread became an instantaneous success. New Yorkers were glad to pay a higher price for bread they liked the taste of. The demand went up to ten thousand loaves a week. The stones at the Rose Mill are kept busy grinding whole wheat, buckwheat, rye and corn for Pepperidge Farm and for other customers. An early American industry which seemed doomed to pass away has been revived, and has become a sizable, modern business.

Van Wyck's Mill, at Fishkill Plains, in Dutchess County, New York, is only a few years short of the Rose Mill's record. It was in 1722 that William Verplanck, a nephew of the Hudson River patroon, built a mill and a house at the far

eastern end of the family patent. When the first Verplanck had bought thirteen miles along the river and as far to the east as he could see—and had prudently climbed the highest mountain in the tract to take that look—the wealth of the land was in the furs it produced. But gradually English farmers began moving into the eastern end of it from Connecticut, closing in upon the river-bank Dutch. William Verplanck was ready for them when they came. His mill was there to grind the corn they raised.

How lucrative milling could be is shown by the house which a grandson of the first miller built across the road from the mill some forty years later. The low, red brick dwelling still stands and in its original condition, with its fine, carved doorway, paneled walls and floors of native oak in wide, hand-hewn planks. Only once in more than two centuries have house and mill and the thousand acres of farm land been sold. In 1828, Colonel Richard Van Wyck, a relative of the Verplancks, bought them. His descendants still live there and keep the mill.

In Lebanon County, Pennsylvania, the house of the miller of Millbach has been made a state museum. The farms in the rich valley of Mill Run poured wealth into Jerg Müller's mill and enabled him and his wife Maria to build a fine stone house. Today this is filled with specimens of early Pennsylvania Dutch furniture, pottery and homespun.

Another mill which did service in pre-Revolutionary times still stands and grinds near Bernardsville, New Jersey. Mention has already been made of one in Columbia, South Carolina; and Tidewater Virginia has several plantation grist mills which have been grinding corn for more than two centuries.

As the tide moved westward, the frontiersmen built mills. Brank's mill in Buncombe County, North Carolina, was one of the earliest landmarks in the mountains. One, built by the settler Reems on a creek named for him which empties into the French Broad in western North Carolina, combined the uses of a mill, a fort and a store. It was the first

building put up on the far side of the mountains. The upper waters of the creek thread cornfields which are thirty-five hundred feet above sea level. There were years when those fields yielded fifty bushels of corn per acre.

The men who pushed westward, beyond Reems' fort and mill, were rebels against the power of the trading class in the Carolinas. In Cumberland Gap, in Tennessee, they built another mill with an enormous overshot wheel which still stands there, though ruined. Those who built it were the men who gathered under the spreading tree on the Watauga and formed the first republic on this continent to be based on a written constitution framed by a community of American-born freemen.

The New Englanders who followed in single file the covered wagon with the words FOR THE OHIO COUNTRY painted on its black canvas top, as this started out at Ipswich, Massachusetts, on December 3, 1787, had an eight-weeks march before they came to Summerill's Ferry on the Youghiogheny. The spring floods took them, and the twenty-six others who had made the trip with Rufus Putnam, down the Ohio to the mouth of the Muskingum. It was on that stream that they built the first grist mill in the Black Wilderness. The mill was also the first business venture west of the Ohio. In that rich corn land it paid profitable dividends.

By the charter of the Ohio Company, lots were set aside for mills, schools and churches, "the three essentials of civilization." The first grist mill in Ohio was that built on Wolf Creek two miles from its junction with the Muskingum River by Colonel Robert Oliver, Major Hatfield White and Captain John Dodge, all veterans of the Revolution. The stones were brought from Laurel Hill, Pennsylvania, and the mill was ready to grind in 1790. Its record flow was fifteen bushels per hour. Today a Grange Hall stands on part of the foundations of the original mill. Men who had spent their youth fighting the Indians, the French and the English looked forward to a comfortable and prosperous old age as millers. It was the one

business which the frontier afforded. George Rogers Clark ended his days as proprietor of a ferry and of a mill on the Indiana shore of the Ohio. This was not a come-down in the social or economic scale of the frontier. The ferry and the mill represented security. They gave their owner a position in that constantly changing world. Usually the miller was the Justice of the Peace, the banker and the sole representative of law and order. He stayed put, while other men pushed on into the wilderness. His mill and his store, his house—which was frequently a tavern as well—where travelers were fed on rye coffee, pork and corn bread, and put to sleep on cornhusk mattresses, were the first civilizing influences in a raw, new territory.

Bonnot's Mill, on the Osage west of St. Louis, was mill and fort in the days before the Louisiana Purchase. Once, during an Indian attack, while the men were busy with the guns, the wife of the French governor discovered that fire had broken out in the mill which was also the storehouse for the settlement. There was no water available to quench the flames. But Madame called the other women, they ran to the sleeping quarters and brought forth homely vessels seldom seen at a fire brigade. They saved the mill, and the fort. And the gallants of St. Louis presented Madame with a silver *pot de chambre* in recognition of her feat.

The grinding of grain was a winter occupation. The fall harvest was seldom dry enough to be ground before December, and all of it was milled by April. From spring to winter the mills would have stood idle had not the millers used the big water wheels to run sawmills, cider presses, flax-brakes, fulling mills and mills for the manufacture of gunpowder. The first of this ever made in Massachusetts was turned out by the grist mill in Dorchester, in 1675.

This widely increased use of the grist mills was made possible by the discovery of iron ore, first in Saugus bog, later near Salisbury, Connecticut. Iron bolts, bearings, screws and

shafts to replace the more primitive wooden ones enabled the millers to add to their occupations. After the Revolution scores of grist mills along the little rivers of New England turned into factories for the making of tools, nails, notions, cotton and woolen goods. Their products were sent out in Yankee clipper ships to be sold all over the world. They were loaded on Conestoga wagons and carted to the western frontier.

One of Plymouth's old grist mills became Eli Terry's clock factory. When he started work on five hundred clocks at once, his neighbors shook their heads, aghast at such temerity. They said there weren't five hundred people to buy clocks in the whole country. Two years later, Terry sold out to two of his workmen, Seth Thomas and Silas Hadley, to devote his time to designing new models. One of these, for which Thomas paid him one thousand dollars, was used to make six thousand clocks one year, and twelve thousand the next. Each copy sold for fifteen dollars.

At the close of the Revolution, the valleys of western New York State were still held by the Iroquois Indians. But in the same year that the first settlers started for Ohio, others began pouring into the country around the Finger Lakes, "like bees out of the Connecticut hive." A settlement was made at Mountville on Owasco Lake in Cayuga County. Naturally enough, the first business in the town was a grist mill. Ten years later there had been added to the grist mill a barrel factory, a triphammer factory, a harness factory, an auger factory, a plow factory, a scythe factory, a distillery, a linseed-oil mill and a woolen mill. It was in the last that Millard Fillmore served his apprenticeship.

The plow factory manufactured wooden moldboard plows. This was the type generally in use on American farms. Various experiments had been made with it. Jefferson spent some time working out a scientific basis for the curve of the moldboard; and a man named Newbold, living in New Jersey, had patented a plow with an iron share, in 1797. But farmers are

by nature cautious about newfangled contraptions. Newbold's plow was practically unknown at the time that a small boy named Jethro Wood, living on a farm on Poplar Ridge, not far from Mountville, began some experiments of his own. There is a story that little Jethro, at the age of five, melted down his mother's pewter spoons and made a plow of the metal. Then he cut bits from his father's boots to make harness for the cat. He hitched the animal to the plow and ran a furrow across the dooryard before discovery and punishment came simultaneously. After that, he confined his experiments to wood and turnips, from which he whittled various designs for plows. One of these was his model when he melted iron in a potash kettle lined with clay and made from it an iron plow.

The year 1819, when the first iron plow was patented, is a milestone in the story of American agriculture. Not that the farmers took to it at once. They did not. Jethro Wood had to give several of them away to make his invention known. Too, American farmers looked even a gift-plow in the teeth. They said the iron would poison the soil and would grow weeds. That it would shorten the hours of labor and turn back the soil in a deeper furrow than any wooden plow could turn was something they had to learn.

But it was Jethro Wood's plow and Cyrus McCormick's reaper which conquered the corn belt and the farther prairies. Today, when the great wheat and corn farms are plowed by tractors which turn over eighty to one hundred acres a day, it is hard to realize that a gang-plow, drawn by five horses, which could plow five to seven acres a day, was a notable agricultural achievement. In 1850, four and one-half hours of labor were required to raise one bushel of corn. Forty-five years later, the labor was cut to forty-one minutes. That was before the days of motor power on the farm. Today, the United States Department of Agriculture estimates that one bushel of corn costs sixteen minutes of labor to produce.

Horace Greeley, whose enthusiasm for the development of

the west was only equaled by his amazement that so many people actually took the trail to Oregon, dedicated his book, *What I Know About Farming*,

*To the man of our age
Who shall make the first plough propelled by steam
Or other mechanical power.
Whereby not less than ten acres per day
Shall be thoroughly pulverized to a depth of two feet,
At a cost of not more than two dollars per acre,
This work is admiringly dedicated by
The Author.*

The grist mills, run by water power, served the farmer directly. The toll which the miller took out of every turn was fixed by law. He sold this to neighbors who did not raise their own grain, or to the stores in the nearest towns.

Essentially, the grist mill was a community enterprise. Franklin pointed out in his *Almanack* that it was the link between agriculture and industry. It was in its way a symbol of the simple democracy which obtained in this country before industrial wealth and power rose to the proportions of an economic problem. Long after iron rolling mills, which were made in England and in France, supplanted the buhrstones for wheat and rye flour-milling, milling as a business was still conducted along very simple lines. Oliver Evans, who fathered so many mechanical inventions, devised a mill which required no hand labor. Thus, at a distance of eighty years, the present unemployment problem was forecast.

For as long as water power was the only power known, grain farming was held in check. It did not pay to raise large crops of wheat or corn many miles from a mill. And mills depended on water to turn their stones or rollers. In the east, where hundreds of little rivers flowed seaward from the fall line, this did not constitute a problem. But west of the Ohio, in the Black Wilderness, the value of farm land depended not only

on the richness of the soil, but on the distance to the nearest mill, or to a canal which led to one.

It was the urgent need to get the corn to the mills that set Ohio to digging a network of canals. What effect these had on the development of the state is shown by the fact that during the decade between 1840 and 1850 the population of those counties through which the canals passed increased 400 per cent. The Ohio canals turned the tide of Ohio corn to New York, and away from New Orleans.

The drivers of the Conestoga wagons who had made big profits carting eastern goods to the western market and bringing farm produce from the midwest over the Alleghenies to the towns in the east, cursed the canals and the men who dug them. At the taverns on the roads they passed the jug of Monongahela whiskey around the table and drank

*Bad luck to the man who invented the plan,
And beggared us waggoners, and every other man.*

It seems impossible to tell the story of the rise of the American people without referring again and again to that Scotch-Irish strain which stiffened the national backbone.

An Ulster immigrant, Thomas McCormick by name, settled in Cumberland County, Pennsylvania, in 1735. His son, Robert, took the trail southward into the Valley of Virginia. His son, another Robert, born in Rockbridge County, was a blacksmith with a turn for invention. He made at his forge several devices for use in grist mills, and worked at a crude threshing machine and a horse-drawn reaper. On the last two he was helped by his son, Cyrus Hall McCormick. Together, on their two-thousand-acre farm, father and son dreamed of machinery which would supplement manpower. Machinery which would enable man to conquer more and more acres of the waiting wild land, and which would pile up golden harvests to be made into bread.

A little more than ten years after Jethro Wood patented his iron plow, Cyrus Hall McCormick came along with a

mechanical reaper. Men who watched the clumsy machine move across the fields cutting swathes of the standing grain saw that this, with the plow, would make them conquerors of the prairies.

True, there were no mills as yet in those miles of unbroken grasslands. But flour-milling no longer depended on water power. For there was steam. With steam at his command, man could build mills wherever he grew wheat and corn. He could plow the prairie in the tracks of the buffalo; he could reap the harvest; and he could turn the golden wheat into flour in the mills he would build.

The plow and the reaper and the steam-driven mills conquered the midwest. They carried America to the foot of the Rockies. In 1849, Minnesota could count five thousand white inhabitants. Seven years later she was a state with a population of one hundred thousand. On the river bank, where Pig-Eye had his saloon, and where the Indians brought their furs to trade, men built mills to grind the harvests reaped from those generous fields. Twin cities grew up around the mills. The boats lying in the river basin were loaded with sacks of wheat flour and of corn meal which they carried down stream to the Gulf, and to all the ports of all the world.

"Some day," men said, "we won't have to ship flour by the river. Some day the railroads will come."

Chiefly it was wheat which the big, steam-turned mills ground. The demand for corn meal came largely from the rural districts, and there the old-fashioned, water-driven grist mills continued to make better corn meal than the steam-power mills could turn out.

True, packaged corn meal, made by the big commercial millers who had driven most of the local millers in the country out of business, kept better than the water-ground meal did. But Americans who had grown up on yellow bread wanted something more than mere economy. They wanted flavor. In the South the Negroes sang:

*Cawn bread an' de black molasses
Is better dan honey en hash
Fer de fahm-han' coon en de light quadroon,
Along wid de po' white trash.*

"Cawn bread" meant pones or batter cakes made from meal ground between stones, and with the rich germ left in it.

It was this demand for flavor as against economy and modern merchandizing that preserved scores of old grist mills throughout the country. The steam mills turned out better wheat flour than the flow from the buhrstones. But wheat was not like American corn. An alien grain, it submitted to processes which standardized it. It imposed no restrictions on the millers.

The corn did.

You could no more run it through a steam-rolling mill and preserve its natural characteristics than you could enjoin Americans to become cogs in an industrial machine. Those who submitted themselves to the mill—like the American corn—lost the germ of their integrity in the milling process.

There is a deep significance, I believe, in the interest which has grown steadily in recent years in whatever is "American." As I see it, we are a people striving to recapture our own flavor. It was very nearly milled out of us, thanks to Big Business and bombastic advertising, and the zeal for standardized equipment and schools and textbooks and college courses. Thanks, too, to the enthusiasm for whatever was European which followed naturally our rediscovery of Europe during the World War.

But gradually the pendulum is swinging back.

Some of the terse, vivid American speech is coming back to tongues which learned sophistication from the novels of American authors who found their egos suffered less in Paris or in Juan les Pins than in Gallipolis or Newburg. There is an American look—it may have come from gazing steadily down a rifle barrel at a wildcat or a grizzly. There is an American

willingness to "make shift" with what we have that I suspect communists and fascists alike find distinctly irritating. Finally, there is an American humor; though this is unknown to Broadway and to Hollywood. Perhaps, for that fact, it is all the more precious, like the *cypripedium aureale*, or the fringed blue gentian.

These are the ingredients of that flavor which is distinctly American. Like the flavor of the American corn, it is too good for us to suffer any social or political process, whether of our own or of foreign invention, to mill it out of us.



XII

With Milk and Sugar Blest

JUST what is this corn which nourishes men and cattle, which has opened vast new territories, dictated political policies, built cities and railroads, and packed canals and rivers with traffic—which, in short, has made American history?

Pull one of the kernels from an ear of corn. The rounded top of the grain is golden yellow and hard. Even the tough beak of a greedy barnyard fowl cannot peck it apart. The sides of the kernels which have pressed against others in the ear are paler in color and not quite so hard. At the base, which fits neatly into a tiny hollow in the cob, the hull ends, leaving a small opening into the center of the grain. Through that channel the juices of the plant have flowed to nourish each separate kernel in the ear as it grew.

Now, with a sharp knife, cut the kernel vertically in two. Even without a microscope you can see that the contents of the horny hull are composed of two distinct parts. At the base, where it is nourished directly, is a bit of substance darker than the rest. This is the germ.

Look well at that bit of oily vegetable matter. It is no bigger than a well-fed dog's flea, yet it holds the entire history of *zea mays*. All this book, and infinitely more, is in that speck which can be lost under your little fingernail. You cannot read that history; but no more can you change it. It is more fixed than the pyramids, and infinitely more mysterious. The memories folded away in that bit of corn germ embrace the *milpas* of the Maya and the unwritten wanderings of the corn, back and forth across the Andes and Cordilleras. It knows the degrees of relationship between *teosinte* and *tripsacum*. It

remembers the ways of the Ozark bluff-dwellers, and the harvest customs of the men who raised the earth mounds in the valley of the Ohio. It recalls the Green Corn Thanksgivings of the Iroquois. Jamestown is there; and Plymouth. And farmers whose names are gone even from the sagging stones in country graveyards. They fertilized an ear of one variety of corn with the pollen from a different variety, and produced a new line.

But that tiny germ holds more than the past. The future is there, as well. Somewhere within that tiny womb, though invisible to the keenest microscope, there are roots with power to drive three feet into the earth. There is a stalk—round and jointed and glossy green—which can spring twenty feet into the air. There are crisp leaves to flutter like pennons in the wind. There is a proud, pale yellow tassel. And on that tassel eighteen million grains of pollen, each and every one of which has power to fertilize the virgin ears.

A million, million bushels of corn stored in that infinitesimal fleck of vegetable matter!

The corn germ is destiny. But even destiny has to be sustained. Round and about the germ, keeping it warm and safe, and ready to its use when the time comes, is a store of food. This is the endosperm, which fills all the rest of the kernel inside the hull.

If you plant this kernel of corn in the earth—before cutting it, of course—what happens is just this: the warmth and moisture of the soil soften the hull. At the same time the moisture, seeping into the germ through the tiny hole at the base of the kernel, awakens the dormant life within it. The germ begins to grow. Immediately its need for food on which to grow is telegraphed to the endosperm, and the supply of protein and carbohydrates stored there are made available to the embryo. Presently, a pale, fragile rootlet stretches out from the base of the kernel, and fastens into the earth. Then another comes. Then another. Meanwhile the top of the hull cracks, and an inquiring leaf sprout emerges, and starts to work its

way upward through the earth of the hill toward the air and sunshine. One day, about a week or ten days after you dropped that kernel of corn into the hill, if the weather is favorable, a brave green leaf shows itself above ground.

The crows will see it, if you don't.

That green leaf comes through the ground only just in time. Like the chick when it comes out of the shell, it is ravenously hungry. It has eaten up all the food supply that Nature put into the hull for it, and it reaches out greedily for more, and more. Now the earth feeds it. The air supplies it with oxygen, and the sun's rays work chemical changes in the stalk and leaves as they grow. Nothing is left of that yellow kernel you once held in your hand. Even the horny hull has disintegrated, and contributed its bit of nourishment to the growing plant.

This follows the general plan of the growth of every seed. Except that the corn is not a seed, but a fruit. It is classed as a fruit because the tough skin of the hull is actually the seed vessel in which the seed is formed.

Every seed, even one as tiny as a grain of mustard seed, contains the life germ of the plant and a store of food to nourish the embryo as this develops toward planthood. The endosperm of every seed of grain—whether wheat, barley, millet, rye, rice or corn—contains carbohydrates and protein for the food supply. It contains some fat too; but most of the fat supply is in the germ itself. The endosperm of the American corn is richer in carbohydrates than is the endosperm of any other cereal grain, except rice.

That high starch content in the substance which surrounds the germ in the kernel of corn is the story of this chapter.

Eighty percent of this country's corn crop never leaves the farms on which it is grown. It is fed to hogs, to poultry, to horses and to cattle. Its cheapness, and its high percentage of starch make it the ideal food to fatten animals for market.

But corn has another value on the farm besides that of making pork and bacon and lard and beef. Corn is milk. And milk

forms 20 percent of the total food of the people of the United States.

Did you know that somewhere in this country your family has a cow?

The more than thirty-six million dairy cows in the United States, which statisticians have figured out as one cow to every American family, carry the largest part of the national farm program. They give us about one hundred billion pounds of milk annually, which means an average of forty gallons per capita. Our consumption of milk has been going up steadily during the past twenty years. When Dr. E. V. McCollum, working in the laboratory at Johns Hopkins University, discovered the vitamins, and how these hitherto unknown elements in our food affected our health, and that milk was the greatest single source of all six vitamins, he started a run on the dairies.

Men and women who had not drunk milk since they cut their first teeth got so interested in vitamins A, B, C, D, E and G and what these would do for them, that they gave up coffee or tea at least once a day for milk. Girls who wanted Hollywood complexions and shining eyes ran for the milk bottle. Schools began to serve milk to pupils, and records showed that marks in classes went up in proportion to the amount of milk consumed. Milk bars opened on crowded city streets. Finally, the debutantes decreed that it was smart to drink milk at all-night parties.

This enthusiastic milk craze, which shows no sign of lessening, developed dairy farming all over the country, until it became what it is today—the largest single source of income to American farmers. Twenty-six percent of the total receipts of agriculture come from the sale of dairy products, and of dairy animals sold for meat. There have been years when the butter, cheese, milk and eggs raised on our farms exceeded the value of the nation's wheat crop.

All this is actually a by-product of the American corn.

In her simple way, the cow is a milk-making machine. The

amount of milk she gives and the quality of it depend very directly on what she is fed, and how much of it. That is something which we have learned in the past century.

The first English colonists in this country hastened to import cattle. In 1624, Edward Winslow brought to Plymouth "three heifers and a bull, the first beginning of any cattell of the kind in the land." "The land" meant Massachusetts; Virginia had had cattle before John Smith returned to England. A great many of the beasts perished during the sea voyage. John Winthrop notes in his Journal for July, 1630,

The Mayflower and the Whale arrived safe in Charlton harbor. Their passengers were all in health, but most of their cattle dead, whereof a mare and a horse of mine.

And in October of the same year, the same diarist records:

The Handmaid arrived at Plymouth having been 12 weeks at sea, and spent all her masts and of 28 cows she lost 10.

Captain John Smith, in speaking of the storms of the Atlantic and the perils of the supply ships, adds, "Of 200 cattell what were so tossed and bruised, three score and ten died."

One might think that beasts which were transported with such difficulty would have been so valuable that their owners would have tended them jealously. On the contrary. In England, at the time, farm animals received little care. Cows grazed summer and winter alike. The colonists brought these casual methods with them. A cow might be given a few corn husks and some wheat stalks; but for the rest of her food she was supposed to forage. As the wild American grass was quite different from that of the lush English meadows, the beasts became thin and diseased. They gave small quantities of milk, and this for only a short period in the year. During the bitterly cold winters they huddled in thickets, or crashed into the marshes seeking food there. In Virginia, it was estimated that the number of cows which died every winter would supply the Negroes and indentured servants with hides for shoes. When

one of the emaciated creatures was seen staggering about the pasture lot in the spring, the farmer would cut a crotch of dogwood and fasten it about her neck, believing this would cure her of the effects of months of starvation. However, the German farmers in Pennsylvania gave their cattle the same care they had given them in Europe, taking them into the houses during the winters. To this day the barns in York and Lancaster Counties are far more imposing and better built than the farmhouses.

As the settlers moved westward, they drove their cattle before them. The farms along the Connecticut River provided good pasturage. Later, Connecticut Valley butter and cheese had a reputation throughout the colonies and in the West Indies, to which quantities of these were shipped. Rhode Island, too, was a dairy state. The salt hay of the meadows running down to its indented shore was good food for milch cows and for horses. Hull, the maker of Massachusetts' pine-tree shillings, conceived the idea of breeding horses on the land near Point Judith. Narragansett pacers became famous all over the colonies, and a source of income to Rhode Island breeders. In Europe the gait of the pacer was a novelty. It was said the colts learned it by being kept in the same field with cows.

Though it was a boast in Carolina, in 1666, that it cost no more to raise an ox there than it cost to raise a hen in England, there was little advance in dairying in this country until the middle of the last century. Up to that time it was accepted that cows would freshen in the spring, give milk through the summer, dry up in the fall and continue so until another spring. Apparently it had not occurred to anyone that the milk-giving period could be prolonged by proper feeding. Indeed, many farmers held that a dry cow was better off with very little food of any sort. In consequence of these dairying methods, milk was scarce and expensive during the winter months. Children got less of it. In colonial times babies were encouraged to dunk their corn bread in warmed cider, in lieu

of milk. But a century later, cider had come under a moral ban. There were babies who got pork gravy instead. In those years America shocked the world by her high infant mortality rate.

Until quite recent years, the milkman drove into town from the farm very early in the morning, and went from house to house, dipping the raw milk from his cans into the pitchers which were set out for him on every doorstep. Milk was just milk. There was no thought of grading it by its butter-fat content. As for pasteurization—no one expected milk to keep sweet longer than thirty-six hours. No one expected, either, that cows and cow barns should be anything but dirty. As for the milker's hands—when he sat down on the stool, he pulled a little milk from the cow's udders onto his hands, rubbed them well and let the drops run off his hands into the pail. This preliminary ritual over, he leaned his forehead against the cow's flank and went to work in earnest, until the warm milk foamed over the sides of the pail.

The tremendous and rapid advance in dairying methods and in the amount of milk produced in this country has all come about within the past seventy years. The shipment of milk to the cities first by rail, later by tank trucks, the discovery of a means of condensing milk to be sold in cans, and the invention of the cream separator, turned dairying into a business. It now represents 23 percent of America's income from agriculture.

The first step toward this was the improvement of the dairy herds throughout the country. Probably the two men who did the most to teach farmers that there was more money to be made from cows of good stock, which were well fed and tended, were Governor W. D. Hoard of Wisconsin, and J. H. Monrad who served Illinois as assistant dairy commissioner. Governor Hoard's writings in the agricultural journals of his state and his speeches on the subject of dairying built up the wealth Wisconsin has today. They also made Wisconsin a corn-growing state. Far and away the greatest part of its corn goes into the silos beside the barns to be fed to dairy herds through the winter. The milk that comes from those herds

goes to the cheese factories which turn out some eighteen varieties of cheeses, under four hundred different names. Cheeses, like Roquefort, which are made of ewes' milk in Europe, are made of cows' milk in this country.

Our consumption of cheese is going up every year, as we make better and still better cheeses. Strangely enough, as our appetites for cheese grows, our taste for butter declines. We are eating less butter and drinking more milk and eating more cheese year by year.

It is not the cow's feed, but her breed, which determines the richness of her milk. The Jersey leads the list in the proportion of butter-fat and protein per pound of milk. The Guernsey comes second. The black and white Holstein-Friesian cattle give the greatest quantity of milk of any of the breeds, but it is the lowest in fat and protein. No matter how richly you feed a Holstein, you cannot increase the proportion of fat in the milk. You get more milk, and through a longer period; but the quality remains the same.

Every year our cows eat about half as much corn as we feed to our hogs. This is not calculable in bushels because most of it goes into ensilage, which means that stalks, leaves and ears are chopped and packed into the silos for fodder. The round towers beside the dairy barns are the first line of defense of the nation's health. In the well-managed dairy herds, the daily ration per cow is thirty pounds of silage (which means corn) and ten pounds of clover or alfalfa hay. Cows which are fed on this diet, with some cereal grain or prepared gluten feed (also made from corn) frequently give forty-five pounds of milk per day.

The chief ingredient in milk is water. One hundred pounds of cows' milk contain eighty-seven pounds of water. The remaining thirteen pounds are divided thus:

- 4 lbs. butter-fat
- $3\frac{1}{2}$ lbs. protein (casein and albumin)
- 5 lbs. milk sugar
- $\frac{3}{4}$ lb. mineral (ash)

Of these, the three and one-half pounds of protein, and the three-fourths of a pound of mineral matter are the most important ingredients as far as the healthful qualities of milk are concerned. We can live a long time without fat or carbohydrates. But not without protein. The last is needed to build up the worn tissues of the body, to develop muscles, nerves, skin, blood and lymph. The body of the average man is fifteen percent protein. The adult requires one-half gram of protein per pound body weight daily to keep in condition. Milk is a valuable source of protein. It also affords phosphorus and calcium. A pound of milk contains three times as much calcium as a pound of wheat. It greatly exceeds the calcium content of corn, though the corn is necessary to the making of the milk. Too, cows' milk has four times as much calcium as human milk contains. Bottle-fed babies should develop good bones and teeth.

Do you know what gives beefsteak its distinctive, delicious flavor? Protein. It's the protein you taste in beef tea and in soups made of beef. All protein does not taste the same. But the protein of the kernel of corn and the protein in the porterhouse steak taste so much alike that no epicure can tell the difference. Perhaps that is what makes corn the ideal food for cattle. At any rate, the corn protein is valuable to the soup and seasoning manufacturer as a beef substitute which has both the flavor and the food value of the meat.

Casein, which is one of the protein ingredients in milk, is unlike anything found in any other food. It is this which forms the skin on milk when heated. It is also the basis of cheese. Casein has commercial values aside from the dairy. It is used in plastics and to make substitutes for tortoise shell. The comb you run through your hair was once a gallon or two of milk. A month or two before that, it was an acre of corn growing in a field. A hawk circled over it, watching for field mice intent on stealing the grain.

The polish on the body of your new car came out of a milk pail. So did some of the glue in the cold-water paints

that finish your house walls. Eighty percent of all the casein that goes into industry is used to size paper. However, the corn does not have to go through the dairy to get into our books and magazines and wallpaper. Even more cornstarch than casein is used in paper manufacturing and finishing.

The corn which comes to us by way of the cow is chiefly valuable as food. As butter and cheese and milk and cream. As *kefir* and *koumis* and *yoghurt* and *clabber*. The first of these soured milk foods is made by the natives of the Caucasus. They make a yeast of grains of *kefir*, add it to milk and allow fermentation to take place. Then the milk is strained and cooled before serving. Like *kefir*, *yoghurt* is reputed to do great things for one by cleansing the lower intestine. It was Dr. Metchnikoff, director of the Pasteur Institute in Paris, who advanced the claims of *yoghurt*, or Bulgarian soured milk. He discovered that the peasants of that part of the Balkans, in whose diet *yoghurt* figured largely, lived to a great old age. Metchnikoff attributed this longevity to the action of the soured milk on the lower intestine. Immediately Paris restaurants featured *yoghurt* on their menus, and the elderly rich all over the world clamored for soured milk and youth. Americans who grew up on farms, or in the days before milk was pasteurized, did not need a foreign doctor to prescribe *clabber* to them.

Of course you can't make *clabber* in all weathers. The best *clabber* requires a sultry day and a thunderstorm to sour the new milk quickly. Lacking a dash of lightning, you can set the crock of milk close to the kitchen stove until the milk turns and becomes solid. Then it should be set on ice, or in the spring-house to chill. Cold *clabber* with sugar, cream and nutmeg is the finest of all milk desserts. It even seriously rivals ice cream. Not in popularity, of course. Nothing else approaches that. We Americans eat two gallons of ice cream per person, annually. And our appetite for it increases every year. It is our national sweet.

Ice cream is a product of American corn. Not only does the milk which goes into its manufacture come from corn-fed cows; also the sweetness of the cream is created by corn sugar, or dextrose. Out of that starchy endosperm in the kernel of corn which Nature provided for the feeding of the embryo plant come syrups and sugars which rival the sweets of the cane.

Maize and sugar made political history on this hemisphere. When Spain had exhausted the mines in the West Indies, she let the islands go to France and Britain. The new owners in the Caribbean Sea imported sugar cane from India, planted it in all the islands and reaped fortunes in sugar far beyond the wealth the Spaniards had taken from the earth. The sugar plantations and rum distilleries poured enormous revenues into European treasuries. During the Seven Years' War, Britain captured not only Canada, but also France's possessions in the Caribbean. These were estimated at a far greater value than Canada and the northern fur trade. In fact, when the preliminaries of the Treaty of Paris were under discussion, there was a serious debate in Parliament as to whether Canada or Guadeloupe should be kept as a war prize. England elected to keep Canada, in order to safeguard her American corn-growing colonies, at the expense of her own sweet tooth.

A century later and the choice would have entailed no sacrifice. In those hundred years science was to discover sugar in the kernel of the American corn, and to develop a method of refining it. The promised land, flowing with milk and honey, was to be found at last—in the American corn belt.

There was nothing extraordinary or daring in looking for starch in the kernel of the maize. Even the ancient peoples knew that most cereal grains contained a sticky substance which could be soaked out of them and used in solution to stiffen textiles. Starched linens were worn by the ladies of ancient Egypt, Crete and Greece. Homer's Nausicaa of the white arms, when she wanted a wagon and mules to carry

the family washing to the river, reminded her father of those "five dear sons of thine, two married, but three lusty bachelors who are always eager for new-washed garments wherein to go to the dances."

In Europe, throughout the Middle Ages, men and women wore leather and woolen and velvet garments against the damp cold. Only in Spain the Moors moved in white, linen-clad procession through the courts of Cordoba's mosque and the halls of the Alhambra. From Spain came the vogue for starched linens, and for ruffs which set off the dark velvet doublets and gowns. Elizabeth welcomed the fashion. Her long, scrawny neck carried a wide ruff gratefully. Her courtiers copied the style; and shrewdly, the woman who said "I am England" levied a state tax on the manufacture of starch.

The high price of wheat started the search for some cheaper source of starch. A French chemist derived it from potatoes, and later from rice. The Louisiana colonists made starch from the manioc roots, and undoubtedly many of the early settlers in this country experimented with maize, as this was the cheapest and most plentiful cereal in the land. Some time after 1800, John Biddes in Pennsylvania made potato starch, and this became so profitable an enterprise that he established a factory in New Hampshire close to the cotton mills which were his chief customer. It was nearly a quarter century later that Thomas Kingsford, who was employed by the factory of William Colgate and Company in Jersey City to separate starch from wheat, worked out a process for the manufacture of cornstarch.

Kingsford's yellow paper-covered package has been an American household commodity for close to a century. From it have come cornstarch puddings and fillings for pies. There were cooks who held out for arrowroot to thicken gravies and over-juicy berry pies, but Americans, generally, felt safe about a product whose base was the American corn. New-born babies were dusted with cornstarch in lieu of talcum powder and started on their way through life. Commercially, starch became

steadily more valuable as industry developed new and wider uses for it.

Starch cannot be manufactured synthetically. It can only be separated from the other constituents of the grain or the root. Exactly what is starch? No one knows. Our knowledge of the substance extends to what it does for the plant and how the plant forms it. But just what it, itself, is remains a mystery even to the chemists. In most plants starch is formed out of water and carbon dioxide gas in the air by the action of the green coloring matter in the plant under the activating influence of sunlight. It is made in the leaves as reserve food material. There it is transformed into sugars, broken down into cell juice and so passed through the cell walls of the plant to the fruit and seeds. There the sugar is reconstructed into starch, and stored as food for the embryo to feed on during the period of germination.

All seeds of all plants contain some starch. And all starch possesses certain distinct characteristics. It is insoluble in cold water. But hot water causes the granules to burst and to form a viscous, jelly-like liquid which becomes firm when it cools. However, the various plant starches have also definite characteristics of their own which identify them when seen through a microscope. Spill a drop of water with a grain or two of potato starch on the glass under a microscope and you will behold dozens of miniature potatoes, and miniature clamshells floating in the water. Those clamshell markings, and the potato-like form of the grains, identify the source of the starch as incontrovertibly as a nest of blue eggs reveal parent robins. The granules of cornstarch are sharply angled pentagrams and hexagrams, each with a tiny cross marked on it. There is no mistaking cornstarch for rice starch, or for the starch of the tapioca.

Besides the varieties in appearance, the starch granules show other peculiarities: potato starch snaps, tapioca starch tends to be stringy. Cornstarch is one of the most amenable of all. This fact, as well as the high proportion of starch in

the endosperm of the corn, and the large quantity of corn available at low prices, make this grain the chief source of starch in America today. While potatoes run from 18 to 20 percent, and wheat from 54 to 48 percent starch, American corn has an average starch content of from 68 to 70 percent. Rice is still starchier, with a 70 to 79 percent content. For several generations the planters in South Carolina and Georgia looked over their rice fields and dreamed of cornering the world's starch market.

The Union victory in the war between the states decided the battle between the Southern rice-planters and the farmers of the corn belt. It was a victory for *zea mays*. The abolition of slavery meant ruin for the rice growers; it spelt wealth for the corn-planters in Illinois and Iowa. For what corn the farmer sells for cash goes largely to the refineries to be used as a source for starch. In recent years Europe has taken to making starch from American maize grown in the Balkans and the valley of the Danube. Roumanian maize is towed up the Danube to Bratislava and on to Passau to be poured into refineries in Germany, whence it comes out as starch for high explosives and as valuable sugar. Not only Roumanian oil, but Roumanian maize, figure in *der Führer's* politics in the Balkans. American corn may possibly play a decisive part in the present European war.

In the same year that Napoleon conceived the idea of ramming the whole of Louisiana down the American throat which had opened hungrily for New Orleans, he also established a blockade against British goods. Chiefly, the embargo was directed against sugar. The French loyally gave up meringues; and the storehouses in England and in the British sugar islands overflowed with sweetness for which there was no immediate market. The embargo spurred French chemists to seek a cane sugar substitute. One of them came to the emperor with information that he had discovered that a sugary substance could be extracted from the juice of grapes. Imme-

diately Napoleon saw new futures for the vineyards of Champagne. He offered a large sum of money to establish the industry, and ordered that all state institutions should use grape sugar. About the same time, another French scientist, Bouillon Legrange, observed that when starch is submitted to a high temperature, it undergoes a change, and when mixed with water makes a viscous, gum-like solution. Actually, what Legrange made was dextrin.

His discovery was employed by a German chemist then working at the Academy of Science in St. Petersburg, in the manufacture of porcelains. He needed gum arabic for his work, and lacking this, substituted Legrange's dextrin. In order to avoid the discoloration due to high temperatures, he subjected the suspension of starch in water to the action of sulphurous acid. He must have continued his treatment for too long a time, for after neutralizing the acid and filtering off the gypsum and evaporating the solution, he found that what he had was a sweetish syrup instead of a gummy one. Through accident, he hit on the way to refine starch into sugar.

The discovery startled Europe. What it offered politically was freedom from British trade domination. Every nation grew wheat and other cereal grains. If these could be separated into starch and the starch refined into sugar, then no one need pay England for sugar from the West Indies. The *Jenarsche Literaturzeitung* exclaimed editorially,

All hail to our wheat fields! In the future they will give us not only flour and starch, but also they will satisfy one of our most refined needs—sugar.

All over Europe companies began to build starch-sugar refineries. Only the defeat of Napoleon's hopes at Waterloo, and the strengthening of England's power in world affairs as the French empire crumbled, held back the new sugar-from-grain industry, and re-established the trade of the West Indies.

But in America, where the farms continued to yield enormous corn harvests, the chemists kept at work endeavoring

to find more and wider uses for the farmers' crops. Naturally, they turned their attention to the refining of cornstarch. While the war between the states was engaging men's attention, an inventor patented a process which ultimately set the present corn-refining industry in motion.

Sixty to eighty millions of bushels of corn from each year's crop go to the refineries to be turned into corn oil, gluten and starch. Besides the billion bushels which are eaten by American hogs and go into pork, bacon, ham and lard, and the billion, three hundred million bushels which feed cattle, horses and poultry and make their returns in milk, cream, cheese, butter, beef, eggs and farm labor, the flow to the starch refineries is a mere basketful out of the corn harvest. But that basketful is transmuted by the magic of modern industrial science into vast wealth and industrial power. Some of the gluten separated from the other constituents of the corn kernel goes back to the farms on which it was grown in the form of cattle feed. The oil goes into homes and restaurants for cooking purposes, and into the manufacture of paints, toilet soaps, linoleum, glycerine. The starch is used as starch in a score of ways, or refined into dextrins, glucose and corn sugar.

Actually, the mechanical process which separates the germ, the gluten and the starch of the grain of corn, and which refines the starch closely parallels nature's process of mastication and digestion. The refineries are like mammoth stomachs into which the raw corn is fed. As with the human digestive system, the ultimate achievement is the derivation of blood sugar (dextrose) from the cornstarch.

Briefly, the grain is received at the refineries, cleaned, and mixed with warm water with a small amount of sulphurous acid to prevent fermentation. After forty-eight hours or so, when the hulls are softened, the wet mass is chewed by machinery, which breaks up the grain while keeping the germ

and the broken particles of endosperm intact. The chewed corn is mixed with more water, and swallowed down a long mechanical gullet. A vigorous stirring-up process brings the germs to the surface of the mass so that they may be skimmed off to be passed on to the machinery which extracts the oil from them. One bushel of shelled corn is estimated to be convertible into one and one-half pounds of corn oil and thirty pounds of starch.

The yellowish liquor from which the corn germs have been skimmed represents the starch and the gluten in the corn kernels. The gluten carries the protein; it is the nitrogenous, or flesh-building, part of the grain. Some of the protein is to be removed for use as flavoring and food value in the manufacture of sauces, soups and other edibles which require the taste of beef. Most of it, however, goes back to be mixed with the corn germs after the oil has been extracted from these, to form a gluten cattle feed.

The separation of the starch from the gluten is done by running the liquid over long, sloping tables. The weight of the starch carries it to the bottom of the troughs, while the lighter gluten flows on. The tailings are run over the tables again and again, until every possible grain of the precious starch has been left on the bottoms.

This starch is the base of the syrups, dextrins and sugars. Flushed off the tables, it is filtered, then dried. Part of it is milled to be marketed as starch, for laundry, industrial and food uses. Another part goes in water suspension to the sugarhouse.

There the cornstarch is subjected to an actual digestive process in great bronze tanks. It encounters the three elements of digestion—heat, pressure, and hydrochloric acid. Twenty-two minutes in the bronze stomachs turns the starch solution into a liquor which when filtered, refined and evaporated, is glucose, or corn syrup.

It used to be the fashion to decry glucose. Some writers on

nutrition actually pronounced it dangerous to health. Mothers taught their children to wash off the glucose from canned fruit, and to substitute for it cane sugar from the sugar bowl. As a matter of fact, glucose is digested sugar. A lump of cane sugar converts itself into glucose in your stomach within a few minutes after you have eaten it.

The longer the starch water remains in the digestive tank the higher the percentage of dextrose becomes. Add another thirteen minutes to the time required for the manufacture of glucose, and the tank will yield corn sugar with a 70 to 80 percent dextrose content. Re-refined, this becomes pure dextrose, which is the most intimate sugar of metabolism and which is absorbed directly into the blood stream, without any digestive modification being necessary.

The relationship between this corn sugar and cane sugar is told by the chemists in the formulas for the two. Cane sugar is $C_{12}H_{22}O_{11}$. Corn sugar is written $C_6H_{12}O_6$. Starch, which is the base of dextrose (corn sugar), becomes by the same figuring $C_6H_{10}O_5$.

Cane sugar is sweeter to the taste than corn sugar. This is an advantage in favor of the latter when it comes to making jams, jellies and certain types of confectionery in which sugar is required for its values and not for its excessive sweetness. Today the two sugars are combined in many candies and confections. Corn sugar has another quality which makes it especially amenable to certain manufacturing formulas: it will absorb flavors without becoming moist. This is something which cane sugar will not do.

Today a large proportion of the corn which goes to the starch refineries goes back to the public in confectionery, ice cream, desserts, soft drinks. The caramel coloring matter in ginger ale, soft drinks and various tonics is actually corn. The same caramel coloring tints leathers in belts, handbags, shoes. Corn has found its way into so many things in our daily life that it has truthfully been said, "Wherever you may be, and

whatever you touch, one or more of the products of corn enter into its manufacture."

When evening comes, all up and down the Main Streets of America the lights of the corner drug stores draw the young people as inevitably as a lantern draws moths. Boys and girls hitch themselves onto the stools in front of the soda counters, and crowd into the booths along the walls. There are much laughter, slangy greeting, and repartee of phrases completely unintelligible to anyone who suffers the misfortune of having been born prior to 1915. The Land of the Ice Cream Soda belongs outright to American youth. The soda jerker in his starched white linen coat and cap is still another priest of Cinteotl, the maize-god. The philters he mixes are sweet with the milk and honey of the American cornfields.



XIII

Corn-Makers

IT WAS the German botanist, Camerarius who first startled the world with the announcement that plants, as well as animals have a sex life.

Though he worked in Europe, Camerarius conducted his experiments with *zea mays*, the American corn. What he had found true of the mulberry and the castor-oil plant, he found equally true of the maize—that is, that the pollen from the stamen is necessary to fertilize the ovules at the base of the plant's pistils.

In a majority of plants the two sexes meet in a single flower or flower cluster. In the corn the sexes are separated as far as the tip of the tassel is from the silk-hung ears. By removing the silk from ears of growing corn, Camerarius proved his belief that the pollen from the staminate tassel which is caught and carried through the husks to the ear is necessary to fertilize the ovules in the ears and to develop these into kernels of grain.

The discovery of sex in plants which was made in the closing years of the seventeenth century was told in letters from European botanists to enthusiastic botanists in this country. So the information came to the eyes and mind of Reverend Cotton Mather of Boston. This divine was fanatically orthodox on all points of the Separatist doctrine, and notoriously severe against witches and sorcery. He exercised rigorous supervision over the private lives of his flock. But he did not shrink from the knowledge that "male and female created He them" applied to the grass of the field as accurately as he

feared it applied to the Congregationalists living on Boylston Street.

In fact, the Reverend Dr. Mather was not above making certain observations of his own concerning Nature's way of propagating the family of *zea mays*. His letter on the subject to his friend James Petiver contains what are probably the first reports on the way of a wind with a grain of corn pollen:

My friend planted a row of Indian corn that was colored red and blue; the rest of the field being planted with corn of the yellow which is the most usual color. To the windward side this red and blue row so infected three or four whole rows as to communicate the same color unto them; and part of ye fifth and some of ye sixth. But to the leeward side, no less than seven or eight rows had ye same color communicated unto them; and some small impressions were made on those that were yet further off.

It would seem that these early American Christian fathers, believing passionately in heaven, dared to believe in earth as well. John Eliot did so. He set himself the task of translating portions of the Bible into the Indian tongue for the conversion of the Massachusetts savages. In the course of that work he had occasion time and again to rejoice in the Indian names for the maize which made possible a literal rendering of such phrases as "the bread of the world," and "This is my body, given for you." As he made his missionary journeys to the villages he invariably paused to survey the fields of growing corn which ringed the huddle of huts. John Eliot found many a text and a powerful argument for the Lord's cause in the maize fields. "That thy sons shall grow up as the young plants" meant to him, and to his hearers, "like the corn." "That thy corn and thy cattle increase" was literally a prayer for bumper harvests of *zea mays*.

No small proportion of his enthusiasm was passed on to his grandson Jared Eliot of the Connecticut colony, who was destined to become not only another minister of the Con-

gregational faith, but the most noted of all colonial physicians and a leader in American agriculture.

Graduated in the fifth class at Yale College, young Eliot was hardly out of the classroom before his neighbors in the town of Killingworth, near New Haven, called him to be their minister. His career is living proof that a man can be a prophet in his own home town. Jared Eliot never had another parish, nor Killingworth another minister for more than fifty years. During that half-century he was also Connecticut's country doctor, who rode from Hartford to New London, from Fairfield to Putnam; with pills and powders in one saddle-bag, and in the other seeds, roots and plants which he gathered as he rode, to plant in his own garden, whenever he got home. People had faith in Jared Eliot's religion and in his prescriptions, too. Perhaps that is what made them curative. That the doctor himself was by way of being a psychiatrist is revealed by the powders he gave to a chronic invalid of hypochondriac temper, which he made himself, sitting in his saddle before turning in at her gate, out of the grit from a broken clay pipe, sugar and starch.

How pleasant to think of that summer afternoon on which the doctor saw a horseman ride up Killingworth's street headed toward Boston. The doctor fully expected to see the rider pass, as most of them did; and as this rider certainly intended to do. It was not his will, but the horse's, which brought him up the lane by the doctor's house and right up to the doctor's stable door.

The man who sat the horse was a short, plump man, with a broad, bland face. This, as he looked at his horse and where that horse had brought him, wore an air of bewilderment. He swept off his hat and bowed in apology to Dr. Eliot. Lifting the reins he tried to wheel the horse away from the stable door.

"On my word, sir, I do not know why the beast should have brought me here into your stable yard."

"But I do." Jared Eliot laid a hand on the horse's bridle.

"I once owned that horse, and he remembers where I keep my corn."

Was it a horse's memory of corn, or fate, that carried Benjamin Franklin of Philadelphia to the one man in all of Connecticut best qualified to appreciate Franklin's extraordinary genius, and whom Franklin himself could best appreciate? Chance does not explain such happenings. The cross-fertilization of men's minds is not accomplished by chance, but by some law of chemical attraction which operates as inevitably as the hungry silk draws the ripened pollen to its need.

The friendship of Franklin and Jared Eliot fired the imagination and the curiosity of each. Franklin shared with Eliot his ideas for *Poor Richard's Almanack*. Eliot confided to Franklin his plan to publish an Annual on agriculture and whatever else might seem to him worth writing about. And Franklin, with a gesture that only an author-publisher could appreciate, immediately ordered fifty copies of the first number.

Jared Eliot's essays, published annually by the author, were the beginnings of American literature on the subject of husbandry. His ideas ran from methods for extracting good "if not the best iron ore from black sea sand" to hog feeding and swamp drainage. With the urgent enthusiasm of a man constantly in the saddle, he piled suggestions for feeding horses on a half-and-half mixture of corn and oats steeped together, on reports of his own experience in planting corn on drained muck land and gathering harvests of from sixty to eighty bushels per acre. He advised fertilizing the corn hill with wood ashes. Already, in the first half of the eighteenth century, Connecticut farmers were complaining that their fields were exhausted. "Drain the swamps," Dr. Eliot prescribed, "fertilize the outworn field. Rotate crops. . . . Corn is hungry; it must be fed to live. But if you feed it it will keep you and yours from want. . . ." "Look upon that plant in blossom time," he wrote, turning preacher in the midst of agricultural advice, "when it is in its full pomp and pride.

Observe its height, its breadth of verdure. That deep green shows it to be replete with rich sap. . . ."

And so into a sermon that his saintly grandsire would most heartily have approved.

With the same degree of serious intensity he presented his readers with a problem in arithmetical progression which the framers of the Agricultural Adjustment Act might well have studied: "If a man has only sufficient good farm land to give him the corn sufficient to feed one hog, let him raise the hog and feed it. Its dung spread on the outworn fields will manure the land to feed another hog, and so on . . ." until he drew a picture of a land literally swarming with cornfed swine.

It was on such subjects as these that he wrote his long letters to John Bartram, the king's gardener at Kew, and which inspired Bartram's trip to and tour of the American colonies. It was Bartram, one remembers, who discovered the giant rhododendrons of the southern mountains and made these known to the world. Jared Eliot's letters to that gentleman farmer, Cadwallader Colden of the New York colony, were forwarded by him to Linnaeus. So Europe became acquainted with the Connecticut country physician of men's souls, bodies and farms. The British Royal Agricultural Society honored him with a fellowship—the first ever conferred on an American.

With President Clap of Yale, Eliot constructed an amazing piece of farm machinery which was drawn by two oxen and which not only plowed a furrow, but dropped seed, and fertilizer and covered these over as it moved clumsily across the field. These experiments fathered Franklin's on his farm near Bordentown, and Jefferson's at Monticello. They inspired Washington's attempts to increase his crops of corn and turnips at a saving of time and labor. Carefully, the ex-Commander in Chief noted in his diary on a spring day in 1786:

Having fixed a roller to the tail of my barrel plow and a brush

between it and the barrel, I sent it to the Muddy Hole Farm and sowed turnips between the rows of corn.

How to raise more corn from every acre of cultivated corn-land was a problem that presented itself acutely to the minds of eighteenth-century American farmers. They believed with Dean Swift "that whoever would make two ears of corn, or two blades of grass to grow upon a spot of ground where only one grew before, would deserve better of mankind and do more essential service to his country than the whole race of politicians put together."

Generally, the efforts of these early corn-makers were directed toward increasing the productivity of the soil and in saving time and labor in the planting and cultivation of the crop. Franklin was perhaps the first American farmer to make scientific experiments with the cross-fertilization of *zea mays*. His scientific interest in the subject was whetted by his human appetite for corn. The letters to his wife, sent from London in 1768, beg her to send him by the first packet out from Philadelphia the American foods for which his tongue watered—apples, cranberries, dried peaches, buckwheat flour and corn meal. And when these finally arrived, what a time there was in the kitchen in West Mount Street, with the American minister instructing incredulous English women in the mysteries of yellow bread and griddle cakes.

Even the French cuisine at Passy many years later was threatened by the philosopher's appetite for cornbread. The last thing Franklin wrote in Europe, besides letters, was the engaging "Observations on Mayz or Indian Corn," which he sent to the chemist Cadet de Vaux on April 28, 1785. It told all that was then known about the use of corn as food for men or animals, green corn roasted, boiled or dried, lye hominy, corn meal, coarse or fine, hasty pudding, hoe cake, cornbreads, popcorn, corn syrup, corn liquor, and corn fodder.*

* *Benjamin Franklin*, by Mark Van Doren, p. 719.

But Franklin's greatest contribution to our national corn culture, aside from the formation of the American Philosophical Society which encouraged the study of all sciences and was the genesis of later agricultural societies in all the states, was his discovery and introduction of broom corn. He found the wild grass and planted some of the seed in his garden at Bordentown. There he cultivated it and experimented with cross-fertilization until he produced a crop which had commercial value.

Mother Ann Lee, the founder of the Shaker colony, instilled into her followers the doctrine, "Hands for work, hearts for God." The Shakers who settled at New Lebanon in New York were quick to see the advantage to them of Benjamin Franklin's creation. They planted fields of broom corn and sold the seed in packets—the first seed to be so sold in this country. It was they who made the first flat house-brooms in their settlement at Watervliet.

The various religious communities which sprang up in western New York, Pennsylvania and throughout the midwest during the first half of the last century did more than add extraordinary tinges to the American culture. All of these foundations were primarily agricultural. And all of them became, in due course of time, agricultural experiment stations. The Shakers in Warren County, Ohio, developed the Warren County hog which played its part in making Cincinnati the Porkopolis of America.

It may very well be that in joining a community, the members surrendered their share of the American dream of moving farther west, at some not too distant time, whenever the horizon threatened to come too close or the fertility of their fields waned. Americans who were possessed by this dream seldom developed scientific farming methods. They were inherently pioneers, developing a genius for making shift, rather than a scientific approach to perfection. But the communists were pledged to remain on the communal lands. As the country round about their claims filled with other settlers,

many of whom looked askance at the religious and social practices of the brethren, they were driven inward upon themselves and so forced to develop intensively what they had. It was this principle which has developed the rich folk cultures of all oppressed and segregated peoples, working among the Mennonites, Dunkards and Moravian Brethren in Pennsylvania, surrounded by the scornful and scoffing Scotch-Irish and Welsh, which gave them their agricultural superiority. The community at New Harmony near Pittsburgh was another fertile oasis of agricultural and horticultural lore.

That extraordinary American mystic, Jemima Wilkinson, who took to herself the title of "The Universal Friend," went in for bigger and better corn. Jemima was born among the Rhode Island Quakers shortly prior to the Revolution. The miracles she worked and her reputed power to raise the dead brought eager disciples flocking to her home. The neighbors were disturbed and shocked, as the cautious faithful always are when the religion they have professed is proved to work. They were not sorry to see the Universal Friend pack up her goods and lead her little band over the new Berkshire road into the Genesee country. There Jemima claimed twelve hundred acres of rich farming land. She settled fifty families on this tract and promptly built the first grist mill in western New York. Her crops of rye and corn and her herds of sleek cattle occasioned wonder and envy among other farmers in the valley. Were Jemima's harvests, they demanded, brought about entirely by prayer, or did the Universal Friend work black magic in the barns?

Jemima could have told them that she joined to her prayers a brimming measureful of common sense. She carefully selected the seed she gave to the earth and prayed over. None but the largest and best-filled ears were saved for the next year's crop. Her disciples, working in the communal fields, learned secrets in seed selection which some of them later took to the corn belt.

Bishop Hill, in Henry County, Illinois, which was founded

by the Norse evangelist Eric Jansen and four hundred followers, was made rich by its broom corn. Four years after founding, the colony numbered eleven hundred persons, and they had put fifteen thousand dollars in circulation in the county where trade until then had been entirely in mink and beaver skins. They even sold their broom in Boston. When the men turned out to do the spring plowing in 1855, they ran furrows two miles long through fields of one thousand acres. When the harvest was gathered, men, women and children marched through the stubble hand in hand, singing Norse folk songs before sitting down to a harvest feast and an impassioned two-hour sermon by their leader.

Thanks to its corn, Bishop Hill prospered mightily until the members of the community became contaminated by the heresy of the Shakers living across the river in Kentucky. The Shaker doctrine of celibacy worked havoc in the corn-growing foundation. The fields were wasted. Tumbleweed rolled crazily down the two-mile furrows. Coatlicue claimed her revenge. The contrast between the latter days of Bishop Hill in fertile Illinois and Brigham Young's settlement on the edge of the alkaline Utah desert would seem to prove that the Freudian theory of sex repression carries its significance even into agriculture.

The first settlers in this country knew four types of maize. When Captain Richard Bagnall discovered the virtues of the Iroquois' sweet corn he added a fifth corn family to the roll. It stands at the same number today.

The five first families of *zea mays* from which hundreds of lines have sprung, and from both sides of the blanket, are

<i>zea mays everta</i>	popcorn
<i>zea mays indurata</i>	flint corn
<i>zea mays indentata</i>	dent corn
<i>zea mays amylacea</i>	soft corn
<i>zea mays saccharata</i>	sweet corn

Popcorn is easily recognized by its small ear and small, hard, pointed kernels. At least that is the type familiar to most Americans who have burned their faces red popping corn over an open fire. There is a variety grown in Jala, Mexico, with ears three feet long and borne on stalks so tall and strong that the crop must be harvested from horseback. The stalks are used to fence stockades.

What makes popcorn pop is the large proportion of hard starch in the endosperm. The moisture in this, when subjected to heat, explodes the starch granules so violently that the kernel is turned inside out. This was the parched corn which the Indians ate and which amazed the English colonists.

The growing of popcorn is a specialized industry. It is localized in Ida and Sac counties in Iowa, and in Greeley and Valley counties in Nebraska. There the popcorn cribs stand along the railroad tracks. In the fall when the crop is harvested, it is carted to the crib and stored to dry through the winter. In summer, when the next crop is growing in the fields, the corn in the cribs is shelled and shipped to the "Cracker Jack" and other candy manufacturers, to empty the cribs in time to receive the new supply.

Popcorn is believed to be a variant of flint corn whose characteristic is its large proportion of hard starch. The flints are the earliest maturing varieties. Therefore they are especially suited to northern climates. It was flint corn growing around the village of Hochalaga, on the site of present Montreal, which amazed Cartier. The flints seldom grow taller than four feet but they bear more than one ear to the stalk, which gives them great value as fodder corn. Flint corn, too, makes the best corn meal, though Southerners stand out for Boone County White, one of the family of *zea mays indentata*.

Dent corn receives its name from the indentation in each kernel—sometimes smooth, sometimes rough but always there—and caused by the shrinkage of the soft starch in the endosperm. This little hollow in the top of each kernel in the ear was recognized by the tribes of primitive Americans as a

female symbol which proclaimed the maternal nature of the corn.

Dent corn forms the bulk of the American corn crop. Its aristocracy are Reid's Yellow, Boone County White, Leaming, Clarage and Silvermine. Each of these F.F.C.'s has a score of descendants, some of which are in the social-register class while others are regarded as family disgraces. Dent corn history really begins in Brown County, Ohio, where a pioneer farmer, Gordon Hopkins, by name, developed a breed of reddish-colored corn which gave such good yield that his neighbors began coming to him for seed. Gordon Hopkins' corn was famous in the Scioto and Paint River Valleys when these were the greatest corn-growing sections in the land, a full century ago. It was a farmer from Brown County, moving westward to Illinois a few years after the Lincolns took the trail to Sangamon, who took with him a sack of Gordon Hopkins' red corn.

That farmer—Robert Reid was his name—planted his Gordon Hopkins on his corn title in Illinois. He was late getting that first crop into the ground—it takes time to clear land to plant—and the first year's yield was small. The Reids tightened their belts against hunger and saved corn for seed the next spring. When it was planted, young Reid was stationed with his rifle on watch for the first marauding crow. Anxiously, the Reids watched for the appearance of the green shoots which would mean their life. When these began to break the soil they counted the hills. And anxiety deepened to actual fear. A great many of the hills never sprouted at all. It looked as though Gordon Hopkins' corn wouldn't stand the Illinois climate or the soil.

Robert Reid's lips tightened grimly. He harnessed the horse and rode round to the neighbors to beg for seed for those empty hills. Any seed so long as it would sprout and make returns in yellow bread. What he brought home in the saddlebag was "little yellow corn," all that any of the settlers had to spare at that after-planting time. He set the kernels carefully

in the empty hills and prayed for crop enough to keep the wolves at least at baying distance.

June spent itself in fair warm weather. July brought a long hot spell when the leaves of the corn crackled and rustled as they grew. The tassels shot up straight and proud and in the last week of the month the hoods came off the anthered stamens and the gold dust drifted on the little breeze that rippled the fields.

On the plants of Gordon Hopkins' corn and on the little yellow corn, too, the young ears stretched greedily from the culms with the soft new silk just protruding from the tips of the ears. Down on the silk fell the golden pollen. Through a whole week the golden rain went on while the corn silk reached out for more and yet more of the life-giving dust.

August came in with rain—and two weeks of hot, damp weather in which the corn seemed to take on fresh life. The ears were swelling fast. Robert Reid went cautiously along the rows and felt the ears with his thumb. His practised hand told him that the rows were well filled, that each green sheath enclosed a vigorous ear.

The corn which was born that summer in Robert Reid's corn title was destined to become the backbone of America's corn crop. Reid's Yellow Dent corn, with the reddish tinge in some of the kernels which betrays its Gordon Hopkins blood and the small dark red cobs, is grown widely wherever the farmers want a soft starch corn. The ears are nine to ten inches long and seven inches in circumference. The stalks are tall, heavy and leafy, with the ears borne high.

Also from Ohio comes the variety still called Clarage for Edmund Clarage who developed this strain on his farm in Fayette County during the first years of the nineteenth century. Ohio, too, was the original home of Leaming, a deep yellow variety which has the virtue of maturing early. Leaming won the prize at the Paris World's Fair of 1878 and gave American corn an international reputation.

Yellow corns are richer than the white corns in vitamin A,

and most farmers prefer them. But in the southern portion of the corn belt, from Columbus, Ohio, to the southern border of Tennessee, the fields are filled with Boone County White. This is a dent corn which was originated by James Riley, a relative of the Hoosier poet, in the rich, dark soil of the American Bottom on the Wabash. It is Boone County White ground between buhrstones turned by water which makes the fine white corn meal Southern cooks prize for spoon bread.

Soft corn (*amylacea*) is the type least grown in this country, though still widely planted by the Mexicans and Indians of our southwest. Its extra large proportion of soft starch makes it desirable for grinding on the *metate*-stone. As for sweet corn—its story merits a chapter to itself later on.

On an April afternoon in 1859, a tall, lanky man in ill-fitting black clothes and with his trousers tucked into his boot tops, country fashion—a figure half itinerant preacher, half lumberman—squatted comfortably on his hams on the bluff overlooking the Missouri at the raw settlement of Council Bluffs and stared speculatively across the river at the westward-rolling prairie.

A little more than a half-century before, Thomas Jefferson had hastened to assure a jittery nation that it was not in line with the American interests to cross the Mississippi "for ages." Thirty years after that pronouncement, young Josiah Gregg was camped at Council Grove in Kansas, preparing for his second trip of seven hundred miles to Santa Fé. The panic of 1833 and the "hell buster" which followed this four years later had not cut down the westward-moving tide. Rather they had acted like tidal waves, which washed a flotsam and jetsam of humanity onto the cheap government lands west of the Ohio. In Jefferson's day Ohio was "the Black Wilderness," and the American Bottom was the far-flung west. But in 1859 men spoke casually of Illinois as "middle west," and were dreaming of the conquest of the buffalo plains and of what

might lie hidden in Colter's Hell. Already the railroads were running as madly as gophers around and across the midwestern states and up to the Mississippi and to the Missouri. Would the railroads stop there, leaving the plains to the Arapahoe and the Sioux buffalo-hunters?

Abraham Lincoln, two years short of the Presidency, and squatting there on the bluff, knew that they would not. The story of American civilization would be written once again on the dun-colored plains. First, the fur-trader, following the Indians. Then the long-rifle men, claiming tomahawk rights, living a less than semi-civilized existence, yet for all that the first advance guard of the civilization they despised and turned their backs on. Daniel Boone, fleeing from the plows which followed at his heels, showed the plowmen the way to the west. After the long-rifle men would come farmers, walking beside their ox carts. Farmers with plows and women with spinning wheels. Carts laden with sacks of seed corn wherewith to subdue the prairies and the plains. And after the first farmers—peddlers, merchants, steamboat and railroad men, promoters of every sort, exploiting the country for the lining of their own pockets, yet, somehow, always being used by the genius of the land to further its wealth.

By these well-remembered beats the American rhythm repeated itself again and again. First the lonely scout's camp-fire of buffalo chips; then the sod hut. Ten years after the sod huts, frame houses and windmills beside them, pulling the precious water up from depths beneath the prairie. Another ten years, and there would be graded roads, and savings banks standing sedately where today the sagebrush sheltered a rattlesnake's den.

And then cities. . . .

There are men who live so close to the wisdom of the universe that they know truths long before the scientists arrive at these by the tabulated steps which science decrees. So Lincoln was intimately aware of the theory laid down by von Liebig that "perfect agriculture is the true foundation of all

trade and industry." This knowledge prompted him, once he was in the White House, to establish a Federal Department of Agriculture, which would aid the farmers in their problems and, not incidentally, arm the man behind the plow to trade safely with men behind the desks of banks and the counters of the produce exchanges.

The second Secretary of Agriculture was "Uncle Jerry" Rusk, a corn farmer from Wisconsin, who had been born on a poor farm in Perry County, Ohio. Uncle Jerry knew from experience drought and wheat rust and grasshopper plagues. He knew that in Iowa the wheat farmers were even then facing ruin. Herbert Quick, who as editor and journalist served the cause of agriculture in the midwest, has told in his autobiography, *One Man's Life*, how the Iowa pioneers, of whom his father was one, were impelled into wheat-growing on a large scale by the pressing need of money to buy the necessities which the prairie did not yield. "As soon as I was able to work," he says, "I became a bond servant to wheat."

At first all that the farmers had to do was to tickle the new-broken prairie with a harrow, and it sang with a harvest. The spring fever was a fever of seeding. Teams, seeders and harrows moved across the black fields from mornglome to dusk. The golden grain went into the soil for a fortnight or so, and then men went out to look for the sprouting blades.

We grew wonderful wheat at first; the only problem was to get it to market and to live on the proceeds when it was sold. . . . But the worst, however, was yet to come. A harvest came when we found that something was wrong with the wheat. No longer did the stalks stand clean and green as of old until they went golden in the sun. The broad green blades were spotted red and black with rust. . . . And when it grew worse year by year, it became a blight not only on the life of the grain but on human life as well. Wheat was almost our sole cash crop. If it failed, what should we do? And it was failing. . . .

Of course what was happening was that the farmers were paying the penalty for a one-crop system. But even the experts

in agriculture did not know that until a quarter century later. All that the Federal Department of Agriculture knew was that farm values were down and dropping further every year. It knew too, as even the wheat-growers knew, that the land would return rich crops of maize. But farmers are proverbially slow to change. It took famine and financial panic, as well as the persuasion of Uncle Jerry's department, to move the Iowa wheat farmers over to a corn and hog basis.

Perhaps if their resistance had been less, the corn-maker would not have exerted so much energy to improve varieties of corn and to discover more and more about corn values. The man who made probably the greatest contribution to this campaign was William J. Beal, who held the post of Botany Professor at the first state college of agriculture to be opened in the country, in Michigan.

Beal's experiments with *zea mays* made corn history. He it was who advanced the theory that the open pollination of the plants prevented the growers from ever being sure of the parentage of the seed. When the mating is left to Nature, there's not a corn kernel so wise it knows its own father. And every kernel in an ear of corn can be begotten by a different father. Beal made the first experiments in detasseling plants, thereby permitting only selected plants to fertilize the embryos in the cobs. Beal had no knowledge of Mendel's Law—that was still buried under piles of papers in a dusty room in Brno, Moravia. But, working in his trial garden at Lansing, pollinating corn by hand, firing the imaginations of his students with visions of future harvests, William J. Beal made an unfading contribution to American agriculture.

Many efforts have been made to work out a test for the fertility of seed corn. Today thousands of corn farmers patiently make "rag dolls" and watch these with grave concern. Six or eight grains of corn are nipped spirally from each ear in a numbered tray, and laid in vertical rows on a strip of wet muslin, which is then carefully rolled over and around each row. The ends and middle of the roll are tied securely, it is

soaked in warm water several hours and then laid in a special box, like a cradle. After five to seven days the kernels will have sprouted, indicating the fertility of the ears from which they were chosen.

These corn mothers have brought prosperity to numberless farms. Not many years ago a professional man in a western manufacturing town withdrew his capital from stocks and bonds and bought a corn farm in one of the Ohio valleys. He himself was no farmer. He engaged a superintendent at a salary of five thousand dollars a year. Even after meeting this and all other expenses, he found his capital paid him a better rate of interest than the preferred stocks and guaranteed mortgages had done. And it was the rag doll which assured him his yearly dividends. Rag dolls and hybrid corn—the latest achievement of the corn-makers—are making fortunes in the corn belt.

The story of hybrid corn begins in the cloister of the Augustinian monastery at Brno, Moravia. Today that cloister is quiet and deserted. The monks have departed, and only a few old couples who lease the tiny houses which form the cloister for a tiny rental cultivate the little walled gardens where formerly the brothers grew their own vegetables according to the rules of the order.

About the middle of the last century, German, Austrian and Czech immigrants began coming to the farmlands in the American corn belt. Those pioneers who built their sod huts and battled stoically against drought, grasshoppers, blizzards, cyclones, loneliness and the tumbleweed, never knew that in the land they had left, a priest son of a poor peasant was making experiments in plant heredity which would ultimately make their grandchildren rich.

Johann Mendel—Father Gregor as he was called in religion—was too delicate in health to be a farmer. Poverty and the rigid Austrian caste system might have kept him from getting the education he ardently craved had not the Church

provided a means. Father Gregor was no theologian. His sermons would not have converted a hungry beggar. It was only in the classroom where he taught that his shyness and ineffectuality left him. There, and in the little garden plot before his house in the cloister, he moved and spoke with authority. Father Gregor had ways the other monks thought decidedly queer, not to say indecent. He had an extraordinary fancy for mice. This was not just a pious tolerance for even the least of God's creatures, such as the blessed Francis would have commended. He actually seemed to care more about, and to give more time to, the contemplation of the gray and white mice he kept in cages—as finer souls kept canaries and finches—than he gave to his books. The rest of the community did not know how much attention Father Gregor gave to the tiny creatures. Or that he did not lower his eyes modestly before their innocent enjoyment of each other according to the laws of biology. Or much more heinous, that he actually encouraged and assisted at the mating of gray mice with white; breaking the solemn canons that had held since the days of the Jewish patriarchs.

Nor did Father Gregor confine his studies of sex to the mice in his cell. Shamelessly, in his garden, he married plant and plant, watching jealously over each mating and the birth of the offspring. Working delicately—nastily, some of the pious monks might have declared had they understood what it was all about—he performed castrations and abortions, played midwife to blossoms and procurer to concupiscent stamens. All in all, Mendel experimented with the sex life of some ten thousand individual plants before he felt prepared to give his theory concerning heredity to the scientific world.

The tragedy was that the world was so little interested in it. No one, not even the German botanist Carl von Nägeli, to whom Mendel timidly sent a copy of his paper, paid any heed. Something in Father Gregor seemed to wilt from that day. "My day will yet come," he said; but there was more futility than ringing hope in his tone. He never lived to see

that day. It was a full thirty years after the publication of his findings that three other scientists, all of them working independently, arrived at the same conviction which Mendel had proved and then discovered among the archives in Brno, Mendel's report which confirmed their own.

Mendel had conducted his experiments almost entirely with peas. Two of the later scientists, De Vries and Correns, worked out their conclusions from experiments with *zea mays*. American corn led to the re-discovery of the Mendelian law. It proved to the satisfaction of the entire world that heredity operates by a mathematical rule which is as true for mice as for men, for the corn as for the pea.

The acceptance of Mendel's law advanced the science of genetics a full half century. American corn-makers, working in various experiment stations, used it as a starting point for the development of new and improved varieties of *zea mays*. One of them, G. H. Shull, working at the Carnegie Institute's Station for Experimental Evolution at Cold Spring Harbor, Long Island, began to inbreed corn. His original aim was to study the inheritance of the number of rows of kernels on the ears as influenced by cross-pollination and self-pollination. His experiments led to an entirely new method of corn breeding, and to the creation of the first hybrid corn.

Actually, what Shull, and after him innumerable other corn-makers, did, was to inbreed certain selected lines for four and five generations, thus intensifying their peculiar characteristics. The seed of these inbred corns was not nearly so prolific as other cross-pollinated varieties. But the experimenters were not looking for fertility of seed. They were interested in intensifying the hereditary characteristics of the chosen strains. After four or five generations, two inbred strains were crossed. The seed so produced had the vitality of a released prisoner, greatly in excess of that of either of the two parent stocks, even before the inbreeding was done. It had also the characteristics of the two parent lines to a marked degree.

In hybridizing corn it has been found that a "single cross"

between two inbred parent lines produces a better corn than either of the parents. A "double cross" between two hybrids, in which four inbred parent lines contribute to the offspring, is still better. A "three-way cross" between a hybrid and an inbred variety—with three family lines involved—is not so satisfactory as a "two-way cross." A "multiple cross," in which eight families are inbred and brought together, is less reliable than a "double cross."

Shull first published his findings in 1908. Immediately the creation of hybrid corns became the chief interest of corn-makers in all the agricultural experiment stations. In this connection it is interesting that previous to 1900 corn had been self-fertilized very rarely by the experimenters. Indeed many persons believed that corn was self-sterile. The World War held back the development of hybrid corns while corn farmers went in for mass production. But soon after 1920, hybrid corn was put on the market for sale and immediately changed corn-growing methods in this country.

Says Merle T. Jenkins, principal agronomist of the Divisions of Cereal Crops and Diseases of the U. S. Bureau of Plant Industry,

It is an outstanding example, perhaps the most outstanding example, of the influence of theoretical scientific research in revolutionizing the production practices of an agricultural crop. Although it is a new development, the hybrids already produced have established their superiority in productiveness and in resistance to wind, disease and other unfavorable conditions.

It is the peculiarity of hybrid corn that its value lies in the first generation following the cross. It is like the mule, a superior animal in every respect except as regards its procreative powers. The farmer who plants hybrid corn cannot save out some of the crop to seed his fields the next spring; he must buy new hybrid seed from the seed growers. True, the cost of seed each year is more than made up by the extra large returns per acre of hybrid corn. Meanwhile hybrid corn is building

profitable seed-growing businesses. Henry A. Wallace, United States Secretary of Agriculture, and owner of the Iowa Seed Company at Des Moines, introduced the hybrid "Copper Cross" in 1924. This, and other hybrid corns, played a part in the A.A.A. program. Farmers could comply with the A.A.A. contracts to cut down their corn acreage, for which the government paid them, and still raise on a smaller acreage, and with less labor, more bushels of corn than they had previously raised. Hybrid corn made this possible.

There were die-hards in the farming ranks who protested, after the manner of the old woman who pronounced the Daylight Saving Law a scheme of the government's to make people buy new clocks, that the A.A.A. contracts were a measure to force farmers to buy Secretary Wallace's hybrid corn seed. But the protests and the grumbling could not go on against the overpowering fact of sixty bushels per acre.

Figures like that renewed faith in the American dream.



XIV

The Courtship of the Corn

WHEN mathematicians hold converse together their speech is pure poetry. The same may be said of the botanists and geneticists. Indeed, it would seem that the further one advances toward the truths of being, the more is knowledge suffused with a sempiternal beauty.

Half-truths, like half-gods, tend to be ugly and obscene. Veils and subterfuges hide the glory from eyes too fearful to behold effulgence. Most of humanity has spent its time with the timid prophet, cowering in the rock, conscious only of the Lord's back parts.

But the cool, impersonal laboratories of the scientists where truth is invoked are the holiest of holies. There, the mere fact that a thing IS is sufficient to make it reverence-inspiring.

The English tongue, which has voiced the greatest poetry, has no impassioned sonnet to place beside the courtship of the corn. Not even Malory can summon a pair of lovers whose desire for each other flames with the intensity of the male and female elements of the maize. Year by year, and a billion billion times over, the greatest of all love stories is enacted in the American cornfields.

The corn enters proudly upon its courting. From the moment the first green blades prick the hills, the plants have been preparing themselves for their great adventure. The culms have grown tall and straight and strong, toward the moment when each one of them shall lift the symbol of its invincible maleness to the sun. As that day draws near, the sheath which has wrapped the stamen through its adolescence can no longer contain the urgent vigor within. It breaks. The

sheath slips back, and a stiff spike of staminate flowers rears above the growing corn.

Each blossom along that spike is laden with grains of living pollen. Eighteen million of these pollen grains have been counted on a single corn phallus. The energy contained in a single corn tassel is beyond man's present mechanics to compute.

These eighteen million pollen grains have developed in the anthers of the flowers according to an exquisitely just law. Each grain had its origin in a "mother cell" containing ten chromosomes. There came a moment when, obediently, this "mother cell" divided itself; dividing also its original chromosomes equally between the two new cells, five and five alike. Nor was this all. The two cells then divided themselves, forming four immature pollen grains. But in this second division the chromosomes followed a different pattern. This time each chromosome divided itself, forming twenty out of the original ten, and grouping themselves in fives in the four pollen grains.

The pollen grains contain something more than the rod-like chromosomes which carry the plant's hereditary characteristics. Each grain has a nucleus. This too, in its turn, receives a signal to divide itself in two in order to perform two separate and distinct functions of procreation. Last of all, one of these two new nuclei divides to form two sperm nuclei which are genetically identical. A microscope reveals these two sperms, shaped like minute crescents, in the mature pollen grain.

During these adolescent changes in the male body of the corn, changes equally dramatic have been going on in the female body—that is, the ear. All along the immature ear are "mother cells" from each one of which grows a filament of fine silk. These "mother cells," which are to perform a female function, obey the same law of growth which compelled the pollen cells to divide first reductionally, and then equationally. Their ten chromosomes, too, fall into the same pattern as the chromosomes in the pollen. Ultimately, where there was one

egg "mother cell" at the base of each thread of corn silk, there are four megaspores.

Thus far, Nature has made no distinction between the male and female elements. Now she does. For while the four pollen grains mature and achieve fertility, three of the four female spores die off. Of the four virgins she has created, Nature selects one to be mated and to serve the race.

This chosen bride develops into the embryo sac. It contains eight nuclei, all genetically identical. One of these is destined to be the corn germ in the kernel, rich in precious oil. Two others will play their part in forming the starchy and glutenous endosperm of the completed kernel.

All through the months of June and July, while the corn has been growing taller and taller, while the roots have been driving deeper and deeper into the earth seeking nourishment in the form of ten necessary chemical elements, this sexual development has been going on. The rabbits and the birds and the field mice have played about the corn, men have paced the rows, and driven tools into the ground about the roots, unaware or heedless of the tremendous and eternal forces silently at work in the green plants. Only when the stamen sheaths burst, and the proud tassels are uplifted above the waving, leafy green, the sowers of the corn stand back, conscious that the great drama of the fields is beginning.

For a day or two the stamens dominate a world which is completely male. No trace of the corn's female nature yet escapes the husks folded about the ears. Do the maiden cells ranged in patient rows along the ears know that their lovers are waiting without, impatient and ardent? What deep biological necessity, all the stronger for the shyness which surrounds it, urges the silk to quicken its growth until the eager tentacles stretch beyond the open ends of the husks?

In the dry, still heat of August even the lightest breeze shakes the ripe pollen from the anthers of the stamen's flowers. The male pollen blows over the cornfields in a fine golden mist. For a week that rain goes on until eighteen million

lovers have left home in search of the beloved. Only a very few of that host are destined to find her. Nature knows full well that the first duty of the artist is selection. As she was prepared to create four female megaspores and to sacrifice three of them, so she brings millions of pollen grains to maturity only to let them float away on the summer wind, unfulfilled and unused. Only a very small proportion of those borne by the stamen find lodgment on the quivering silks.

What sense tells the pollen grain that this thin, wavering, green thread is the one sure route to his mate? Immediately, on that first contact, the first of the two original nuclei in the grain develops into a tube which runs down the corn silk, six, even eight inches to the sac embryo to which the silk leads. What a journey for a bit of an infinitesimal fleck which only the keenest lens makes discernible! Odysseus and Ulysses were stay-at-homes compared with this lover. Down that tube, as it grows along the silk, travel the twin sperm nuclei which were formed in the pollen grain.

The Quiché Indians of Guatemala tell a tale of twin brothers who made a journey into the Underworld, and there met their deaths. One of them, though dead, caused the princess of the Underworld to conceive. For a time she remained in the Underworld, hiding her condition, but ultimately this became known and she was cast out into the Upper World. There she gave birth to twin sons.*

Xquiq of the legend is the American Persephone. All Underworld goddesses have a connection with fertility and with grain. True to the universal pattern of the myth, Xquiq on reaching the Upper World exerts amazing power over the maize. Her twin sons work maize magic.

Did those long-ago tale tellers among the Quichés have the knowledge botanists have arrived at by scientific experiments that not only is the embryo sac in the ear fertilized by twin sperm nuclei, but the kernel of corn itself is actually

* See Chapter XVIII, "Maize Magic in American Folklore."

twins? One twin is the oil-rich germ. The other is the starchy endosperm.

After all, there are ways of knowing without the aid of microscopes and test tubes. Does not Goethe say,

*Is not the kernel of nature
In the hearts of men?*

The male contributions to the germ and to the endosperm are identical. So, too, are the female contributions, genetically. But the female contribution to the endosperm is twice as great, quantitatively, as it is to the germ. The mother in the corn provides liberally for the child she carries in her womb. Two of her nuclei went into that mating with one of the pollen nuclei to create the protein and the starch stored in the endosperm.

The ten chromosomes of the male element and the ten chromosomes of the female element meet, mingle and still remain ten. They are the bearers of the plant's hereditary characteristics—the genes. Botanists have identified no fewer than three hundred and fifty genes in the American corn which are divided into ten groups, one of which is carried on each chromosome. Some chromosomes carry a great many genes; others are responsible for only two or three. But, by inevitable law, the genes which are linked together on a chromosome are inseparable. For instance, the gene for pod characteristic and the gene for sugariness are united. You cannot have one without the other. Apparently their union is as indissoluble as the Hapsburg lip and the genius for political blundering.

The genes located on the same pair of chromosomes tend to be transmitted from parent to offspring. This law of heredity which never fails and which the researches of Mendel and of later botanists and geneticists have worked out into a mathematical formula, has recently disclosed a hitherto unknown chapter in corn history. It has presented science with

a solution of one of the botanical mysteries. It has found the origin of the American corn.

The origin of *zea mays* has been explained by various botanists in various ways. Some authorities believed that the corn as we know it developed from a primitive corn very similar to the present cultivated varieties. Others believed that *zea mays* traced its descent from *euchlaena mexicana*, the wild grass which the Mexicans call *teosinte* (gods' grass). Still others played with the idea of a possible relationship between the maize and *tripsacum*, another wild grass of the Guatemalan highlands.

About the middle of the eighteenth century, the Chevalier Lorenzo Boturini Benducci, an Italian nobleman whom Dr. Borrull of Salamanca called "an ornament of all sciences and a stranger to none," went botanizing in Central America. He reported:

I found in New Spain a wild maize that grows amidst forest or woods with a small ear whose few grains were more delicate in flavor than the cultivated kind.

This sentence of the Chevalier's acted on botanists like a pirates' map on treasure-seekers. Again and again, through the two centuries since he wrote them, men have gone into the highlands of Guatemala seeking the wild maize which might solve the mystery of the origin of our American corn. Within the past decade, Oliver La Farge started up the quest again by a statement that at a village between Menton and Chacula, at an altitude of five to six thousand feet, he ate young corn ears two inches long, "like oat sheaves without the whiskers." He added that in the same district there grew "a tall grass like silage corn run to seed, the ears and tassel of which were edible and were green in rainy weather. This," he concluded, "may be the maize Boturini described."

While various eager botanists like Dr. Wilson Popenoe of Guatemala City were combing the country for clues which might solve the mystery, in the Texas Agricultural Experiment

Station two geneticists were at work on the same problem. Using Mendel's law as a basis for their experiments, they set to work with *zea mays*, *teosinte*, *tripsacum* and several other possible relatives of the family, even including the familiar garden plant called Job's-tears, to discover how the chromosomes on which the genes are formed differ in and resemble each other in maize and its relatives.

It was a stupendous task, involving thousands of individual plants and years of research. In 1939, the experimenters, P. G. Mangelsdorf and R. G. Reeves, published their findings in a bulletin put out by the Texas Agricultural Experiment Station. Actually, they had solved by science the mystery which had baffled botanists since Columbus first brought maize to the attention of the European world.

The steps by which Mangelsdorf traced the lineage of our American corn are so complicated that only a geneticist can follow them in order. Briefly told, they prove that ten to twenty-five thousand years ago, before the Asiatic immigrations to this continent, a wild maize flourished in the highlands of Central America. The winds blowing south carried its seed as far as the Andes. The winds blowing north bore it to Mexico. In the highlands of Mexico this primitive wild maize met and mated with the Mexican *tripsacum*. The child of that marriage was *teosinte* (*euchlaëna mexicana*).

For centuries wild maize, *tripsacum* and *teosinte* flourished side by side. But the winds were not through with their alchemy. *Teosinte* and its parent the wild maize mated. Of that cross came *zea mays*, the foundation of Mayan and Aztec culture, and destined to be the food of the American nation.

What became of the wild maize which blew south into the Andes? Its story is lost with the four civilizations which flourished and vanished before the Incas ruled Peru. Whether *tripsacum* went south with it or not, no one knows. But seeds of *tripsacum* and seeds of a primitive dent corn have been found in the ruins of the Ozark Bluff Dwellers, showing

that *tripsacum* did not remain entirely within the limits of Mexico.

Since the geneticists have provided our corn with a family tree that stretches back a possible twenty-five thousand years, and with an all-American ancestry, there is nothing to make it feel abashed in the presence of the cosmopolitan wheat. No truer emblem of pan-American relationships can be found than *zea mays*, which feeds the three Americas with bread.



XV

Cornfed Culture

OLD theatregoers in Chicago still recall the stage curtain at the Garrick Theatre, with its florid decorations of ripe corn and the painted legend:

The corn! The corn! Within whose yellow hearts there is of health and strength for all the nations. The corn triumphant!

The lines, as every Illinois schoolboy knew, were a quotation from Governor Oglesby's famous speech at the Harvest Home Festival of 1892. In the flowing rhythms of the era of the Prince Albert coat and rippling whiskers, Illinois's chief executive paid rhapsodic tribute to the crop which made the state rich.

And the state remembered the speech with pride. Schoolboys learned it in elocution classes in country schools, and recited it at commencement exercises. Their parents, mostly Illinois corn farmers and their wives, filled the audience. Their hands, hardened and gnarled by long service in the fields, lay quietly in broad laps. Their minds were divided between humble admiration for their offspring and a dim awareness that the green crops in their fields had a value not entirely computable in bushels and dollars. The corn they sowed each spring and harvested each fall offered more than nourishment for men's bodies. It had a cultural and spiritual significance as well.

America's cornfed culture is peculiarly her own. It has dominated this continent through four centuries. We have swallowed Spanish, French, English, Dutch, Swedish, German and a dozen other cultural ideas. As wave after wave of foreign immigration washed up on our Atlantic shore, and swept far-

ther and farther west, they brought traces of a score of European cultures. The Norskies who drove their *kubberulles* into the new lands of Wisconsin and Minnesota took with them folk customs of Scandinavian origin. The Norwegians, Danes and Swedes who came to this country were moved to emigrate by no resentment against conditions at home. Their motive was economical. They had therefore no urge to forget the past, and for a generation they kept their folkways. But within that space of time their persistence in these began to manifest the fanaticism which is inevitably inspired by a cause known to be already lost. The small grain cultures of Europe were eventually blotted out by the corn.

The earliest and most striking evidence that there is an American culture is to be found in our national oratory. The Gaelic gift for discourse which was part of the heritage of the Scotch and Irish who came to the colonies during the seventeenth and early eighteenth centuries was prompt to assert itself. Americans were quick to speak their minds. Even quicker to speak their feelings. They protested and they ad-jured. They exhorted and they preached. They testified at religious revivals, and they confessed their sins with a richness of simile that an Old Testament prophet might have envied. They led lengthily and rhapsodically in prayer. Wherever two or three were gathered together one was sure to make a speech. Though they spoke in English, they developed an American speech and an American style. The contrast between the speeches of Burke and of Patrick Henry, born of the same racial stock and inspired by the same cause, is the contrast between oats and corn.

A generosity of phrase and of gesture marked the oratory of Clay, Calhoun, of Thomas Benton who dreamed of a road across Missouri to India, and of many of the politicians of the Mississippi Valley, down to Bryan. These men sprang from the cornfields. The corn was in their blood. Its largess bred in them a corresponding generosity of emotional expression which found an outlet and an appreciative audience at torch-light processions, county elections, Fourth of July outings,

Grange picnics, Harvest Homes, camp meetings and Chautauquas. At all of these, soon or late, someone was sure to launch into a tribute to one of the three national symbols which never fail to stir American audiences to enthusiasm. These are the flag, our mothers and the American corn.

Beside this flow of florid oratory the economy of Lincoln's phrases becomes the most vivid evidence of his genius.

Not that audiences objected to the rhetorical flights they were treated to. They, too, were cornfed. They were bred to lavish exuberance. They had no fear of giving vent to their emotions. The gift for understatement which was no small part of the genius of New England, and which resulted directly from their lean harvests, would have struck a corn-belt audience as too stingy to be truly American.

A cornfed culture is not nice in the sense of esthetics. Van Wyck Brooks has called attention to the "village mind" of Connecticut. This is keen, witty, carping. But not, truly speaking, critical. In general, the American mind has developed small genius for analysis. That property belongs to peoples who have threshed and winnowed small grains and who have lived on small lands and in walled towns. It does not mark those who have gathered into baskets four hundred-fold. We produce propagandists and objectors, but, to date, no great critics.

Europeans are apt to find the sweeping gestures which distinguish the American style particularly irritating. Americans, who are childlike in their eagerness to like everybody and to be liked, are frankly puzzled that English lecturers will make derogatory remarks about a people who are so willing to part with their dollars for tickets. They want to know where the catch is. There is no catch; only the entirely natural resentment of an underfed people toward the evidences of another nation's wellfedness.

New England boasted that its chief export to the Black Wilderness was schoolmasters. Schools were as important as

churches in colonial Massachusetts. The two ministers who came out with the first supply of colonists to Salem prayed, and then drew lots, to decide which one of them should serve in the pulpit and which behind the schoolmaster's desk. Tuition at those early schools was paid in corn. The Reverend Francis Higginson of Salem, who drew the school and not the meeting house, used to station a pupil at the schoolroom window to sell the surplus of corn to passers-by. When the plans for Harvard College were going forward, every family in New England was pledged to give one peck of corn, or twelve-pence, or its value in wampum peag to the institution.

Meanwhile Virginia evinced a happy disregard for education. That choleric governor Sir William Berkeley exclaimed, "Thank God there are no free schools or printing presses. I hope we shall not have these for one hundred years."

His hope was to go unfulfilled. Only thirty years later his capital was selected as the site of the College of William and Mary. Not that there was widespread enthusiasm over plans for educating either the sons of the planters or the young Indians.

"You must not forget," Dr. Blair reminded Sir Edward Seymour, "that people in Virginia have souls to save."

"Souls," Sir Edward snorted. "Damn your souls! Grow tobacco."

Virginia did grow tobacco; but she also built her college which started immediately a pattern in education very different from that of Harvard, and later of Yale. William and Mary was the first college in America to allow students to elect their studies. In the English world it was the second college to have a chair of Municipal Law. It was the first in America to teach history and political science. The men who went out from it carried the idea of a university which served the growing cultural and social needs of a people. This idea was the germ from which grew our state universities.

The Virginians who ran over the mountain line into Kentucky, and gathered eighty bushels of corn to the acre from

that rich soil, started their own seminary at Lexington. The educational ideas on which it was founded in 1788 originated in Williamsburg. But these ideas, like the men who carried them, had crossed the mountains. The classic pattern was abandoned in favor of utility. The Transylvania Seminary was the first intellectual center west of the Alleghenies. The tuition was £5 a year, half of it payable in corn, pork or tobacco. Board cost £9; but all of this could be paid in barter.

Kentucky's amazingly rapid growth from a population of sixty-one thousand whites three years after the opening of the Seminary to 180,000 in 1797, kept the Seminary filled with students. The boys who studied there, who walked across the fields of bluegrass to talk with Henry Clay on his six-hundred acre farm, or who crossed Clark's Ferry to the mill for a glimpse of the old scout, nonetheless a hero for his affection for the jug of corn whiskey beside his chair, who saw the militia mobilize and march north to fight the British in Canada, received an education which was acutely alive and of the time. Harvard, Yale, William and Mary were as remote from the scene where America was being made as some medieval cloister. But Lexington was on the frontier where things were happening.

When those boys went out to raw, new settlements in Illinois, Indiana, Missouri and farther west they carried into the wilderness ideals of education which were to leave an indelible stamp on our American culture. The constitution of Illinois, framed in 1816, called for "a general system of education ascending in regular gradation from township schools to a State University, wherein tuition shall be gratis and equally open to all."

New England had never dreamed such a dream. It was in the corn belt that the idea of the state university came into being. What made the essential difference between these state institutions and the old endowed universities in the East was the strong link between the first and the public schools of its state. In those schools every pupil was encouraged to seek

higher education. A college degree was not held up as something too sacred for the majority to dare aspire to. It was presented as the common right of all Americans.

Frederick Jackson Turner, in discussing "Pioneer Ideals," declares, "By its system of public schools from the grades to graduate work in the state universities, the West has created a larger single body of intelligent plain people than can be found anywhere else in the world."

Not the least of the power of the state universities was vested in the fact that they were the property of the people. Their roots were in the soil. As state institutions they were free from the control or influence of any church or religious or social group. They were essentially democratic. So they have created a culture which represents American democracy. That spirit began to be blown eastward about a century ago, profoundly affecting the culture of the Atlantic seaboard. The midwestern universities with their acceptance of science and their zest in applying science to all the problems of the time and the environment jolted eastern scholasticism out of its bondage to classical traditions. Michigan, the first of the state universities, booted Yale into organizing a department of scientific agriculture which was presided over by the great Dr. Norton, whose influence touched all the agricultural writers and editors of the country for a generation.

From the state universities, too, came the idea of shaping the university to the needs and demands of the student body; not selecting a student body to fit the inflexible shape of the university. This ideal has gradually influenced the old colleges in the east, though they resisted it for years. Their trustees and governors, the majority of whom had found small use for Greek and Latin in Wall Street but who had the successful business man's fixed idea that the road by which he has traveled is the only one to success, stubbornly held out against innovations from the corn belt. The competitive, cutthroat world of high finance gave them no outlet for their latent sentimentality. Their relations with their wives and daughters

were rigorously controlled. But on the subject of "dear old Alma Mater" they could let themselves go. They were as jealous of every one of her funny, old-fashioned eccentricities as Cromwell was of his wart.

Ultimately, however, the demand for realism was pressed too hard by the student bodies to be denied. Student strikes demanded a more flexible elective system, and a voice in university affairs. Even Harvard has partially succumbed to the ideals of cornfed culture.

To Benjamin Franklin belongs the honor of founding the first society devoted to the study of agriculture. That was thirty years before the Revolution. In the two decades after the struggle, similar societies sprang up in the new states. Men like John Jay, Robert Livingston and Elkanah Watson, the builder of the Erie Canal, recognized that the true foundation of the nation's wealth and security was the farm. So New York had its Society for Promoting Agriculture, Arts and Manufactures, and at the meetings discussed such ideas as "Raising Crops of Corn from Street Manure" and "The Advisability of Turning Loose Alpine Chamois in our Mountains."

In the rapidly developing agricultural region west of the Ohio, farmers were too busy, and lived too far apart to attend meetings. When two or three of them chanced to meet at the grist mill or at the wharf from which they shipped their crops by boat, they swapped experiences, horses, mules or a handful of seed corn. They were much too occupied with the struggle of growing up with the country to take stock of how they grew. The social unit was the individual family, not the community. Life centered about the single hearth.

The settlers on the corn belt farms had left villages and towns in the eastern states or in Europe to undergo the experience of isolation on the frontier. That experience had an effect upon men and women from Connecticut and the Genesee Valley who went to the Black Wilderness and the Illinois

Country similar to the effect of inbreeding on the American corn. It intensified hereditary characteristics. It strengthened genetically the American mind.

Just as the corn, during the generations of its inbreeding, dwindles in height, vigor, beauty and creative power, so the generations of men while the inbreeding process continued produced little of cultural or spiritual value. The midwest, during the half-century that preceded the war between the states, presented the world with a picture of crudity which has seldom been surpassed. The legendary heroes of the era were Paul Bunyan and Mike Fink. Those were the years of the lanky, whiskered, tobacco-spitting land speculators; of the sleek, soft-spoken gamblers smoking long, Cuban cigars; of the show-boats on the river and the medicine shows on the roads. It was the America of Joseph Cobb's *Mississippi Sketches*, the America painted by William Sydney Mount whose brush relished the raw flavors of his time as much as Hogarth's or Daumier's pencils caught the peculiar tangs of their London and Paris. It was the America which the *New York Times* sent Frederick Olmstead out to discover and to report. Olmstead's newspaper articles—later these were published as a book, and republished a few years ago—belong with William Byrd's *History of the Dividing Line* and John Smith's *Virginia*, as chapters of our national saga.

English and French literary observers who visited the Ohio and Mississippi Valleys—Chateaubriand, de Crèvecoeur, Harriet Martineau, Mrs. Trollop, Dickens, to name only an outstanding few of those who came—were frankly nonplused by the gap between transmontane America and Concord. The thought in the communities lying along the seaboard was crossed and recrossed by a dozen different strains. It was fertilized by every wind that blew. It heaped harvest baskets with the golden hoard of Emerson, Thoreau, Poe, Hawthorne, Lowell, Melville. Critical Europe bowed before these titans. At Casa Guidi, Margaret Fuller was received with homage. Carlyle admitted the fact of American genius.

But it seemed to most observers that the cause of culture in the corn belt was already lost. What was happening west of the Alleghenies was a process beyond the understanding of the generations whose metaphysics had never embraced Mendel's Law.

The New England stock planted in Ohio and Illinois and undergoing that process of inbreeding had among its hereditary genes the zeal for missionary endeavor. This gene would seem to be on the distaff side. In the midwest it began to manifest itself in the country schoolmarm. In hundreds of little red schoolhouses, scattered across half a dozen farming states, women teachers armed with Puritan consciences and McGuffey's Readers, dedicated themselves to the cultural conversion of the country's heathen youth. The majority of the men who rose to positions of prominence in the midwest taught school at the outset of their careers. They taught for a livelihood while they studied law at night and dreamed of a future in politics. But the women who became teachers entered the profession with the holy zeal of nuns answering a call to religion. These granddaughters of Massachusetts ministers and sea captains brought into the district schools the spirit of the evangelist and the discipline of the quarter-deck.

Grandmother Webb was fourteen in 1849. That year her father caught the gold fever and sailed round the Horn for California. Her mother packed up the children and her goods and went to live with her brother on his farm. At the Christie Street School in New York, fourteen-year-old Julia Needham had been the star pupil. The only one in the class who could spell "Nebuchadnezzar" for the examiners when they made their yearly visit, she had been promoted and was in line for a scholarship at the Albany Normal College. The fame of her scholarship went to the farm with her. Before fall term, and long before the ship *Samoset* made San Francisco, the district school trustees called on "Miss Julia" and offered her the post of teacher. It carried a salary of fifty dollars a year. Her duties were to teach all the children who might come to

school, ranging in age from five to eighteen, to sweep out the schoolhouse every day, ring the bell and keep up the fires. The trustees supplied wood for the round-bellied stove, but the splitting of the cordwood sticks into stove lengths was left to the teacher.

Grandmother taught that school until she married Grandfather Webb. After that she had her own school in her kitchen, at night, to teach the Negro stable man and his boys how to read and write.

Though reared a Universalist, she offered her services to the Episcopal Academy in the neighborhood and was welcomed there until the rector came to call on her one day and caught her reading Swedenborg. Grandmother's teaching career ended in disgrace and social ostracism.

But generally, throughout the country, the district school teacher exerted an incalculable influence on American culture. Her Puritanism acted as a check on the flamboyant rhetoric the local politicians indulged in. She taught Spenserian penmanship, spelling, the simple, declarative sentence and an innocent reverence for the classics. She imparted to the youth of the corn belt her own feeling about culture, which was only comparable to what early New England had felt about religion. Her school boys who became lawyers, senators, judges, railroad builders, and oil kings never lost that feeling. Their response to it presented Cincinnati and Chicago with art galleries and conservatories of music. It endowed dozens of schools and universities throughout the midwest. It built grand opera houses and subsidized lecture programs and classes in art and literature and music. It supported the Chautauqua.

Still later, it inspired many of the foundations dedicated to philanthropy and scientific research. A number of the largest of these spend corn millions. The money in their endowments came literally out of the cornlands. Even the wealth represented by Standard Oil, and administered by the Rockefellers and others in the Standard Oil combine, is mixed with corn.

It is a fact that many of the richest oil fields in the country were discovered not by engineers sent out by companies, but by wildcat prospectors, the sons of corn farmers who were too impatient to follow the plow. Instead of furrows, they drove wells. When the cornlands turned black, not green, they sold out to Standard Oil, which made millions where the original prospectors made thousands. And where the farmer, who had been first on the land, had rejoiced to reap thirty bushels to the acre.

It is not without significance that a number of the midwestern millionaires should have evinced a willingness to dedicate millions to culture and scientific research, an attitude toward the responsibility which wealth imposes which is not generally shared by rich men whose fortunes have been made by trade and speculation in the eastern towns. One has but to examine the record in philanthropy of the Vanderbilts, Woolworths and Astors and that of the Rockefellers, McCormicks, and Armours to discover, behind the midwestern millionaires, the shade of some long-ago Miss Julia in a little red school-house somewhere in the corn belt, who impressed upon her pupils that money spent on culture was, in a sense, given to the Lord.

The harvest of the hybrid corn is derived from the crossing of two inbred lines. The meeting of various inbred foreign cultures, and the inbred American variety there in the states of the midwest, and above all in the state universities, has produced the most vital influences in American literature during the past forty years. Even before Dreiser, Sherwood Anderson, Carl Sandburg, Willa Cather, Edna Ferber, Booth Tarkington, Vachel Lindsay and Sinclair Lewis came out of the cornlands, Mark Twain and Bret Harte had taught America to laugh at Mississippi Valley humor. Later than these, though of their tradition, was Charles Stewart, a writer too little known. Following them, O. O. McIntyre brought Gallopis to Broadway. The country was inclined to accept the

midwest with amused tolerance. It responded to Eugene Field, and to the folksy quality of James Whitcomb Riley, even though it refused to take them seriously as poets. They were "cornfield writers," as Joel Chandler Harris dubbed himself.

Riley knew his country. Well he might. Early in his career he was a blackboard artist and sign painter advertising Doctor Townsend's Magic Oil. When the medicine show drove into town, with the horses sleek, the harness polished and the plumes atop each bridle tossing proudly, Riley and the Doctor's son Jim were already at work leaving handbills at the homes of the town's leading citizens, enlisting the sympathetic interest of the mayor and his lady. At night, when a crowd filled the town square in front of the torchlighted platform, the show went on. Farmers gaped at the juggler, laughed at the clown, applauded the sentimental ballads and listened earnestly to the speech made by young Jim Townsend, who was destined later to be a political force in Ohio. Jim's best speech was about the human "hopedunum" and the ills it could fall heir to, and the suffering these ills would cause the hopedunum's unfortunate possessor. What the human hopedunum needed, the speech made clear, was Doctor Townsend's Magic Oil. And plenty of it, at one dollar the bottle. Without the Magic Oil the hopedunum would grow more and more cantankerous, the individual would grow thinner and thinner—here Riley's chalk went to work on the blackboard, sketching a cadaverous human being with what appeared to be a snake eating its vitals—the marks of acute pain would show in the face—chalk marks by Riley—the hair would fall out (work with the eraser) then the teeth. Finally . . . There was no need to put the end into words. Riley would draw a coffin about the hopedunum victim, and already the crowd would be pushing forward, dollars in hand, to buy bottles of saving oil.

The west behind Sherwood Anderson, Lindsay, Sandburg, Lewis and Willa Cather is the west of the medicine shows and the Chautauquas, of grange picnics and state corn-

huskings. All of them knew state and county fairs, corn-judging contests and hog-callings. At the time they began sending manuscripts to publishers in New York and Boston the East was still under the spell cast by Henry James, in whose veins the American blood ran so thin that he was driven to retreat to London from the frontier as represented by Beacon Street. James' flight had coincided with the advent in Boston of William Dean Howells. Howells was born in the corn belt. He had "limped beside his father, with his eyes on the cow but his mind on Cervantes and Shakespeare." As James had sought security in England, he ran away from the farm to the bosom of the *Atlantic Monthly*. "You have more passion than I have," James confided to him after reading one of his manuscripts. It was the faint trace of cornfed culture in Howells which the born Bostonian detected. Poor James, who could look at a quince tree and only see it "full of antiquity and contortions." How gratefully, after that, one lets Sandburg take one up-river with Lincoln in the cool, American Spring.

Frequently it was hard for the East to understand that these young writers out of the corn belt were not funny. They were as serious about people living in sod houses on the Nebraska prairie as if these had been Ethan Fromes. They wrote as if the midwest mattered. And as if Main Street were all of a piece, from Bangor, Maine, to Denver, Colorado.

In the cities of the corn-growing midwest the Rotary and Kiwanis Clubs developed a business fellowship which the East, at first, found faintly amusing. It laughed, even while it adopted the idea. These clubs, dedicated to bigger, better and friendlier business, accomplished something more than profits for the members. When Professor Edward Lee Thorndike made a survey several years ago of three hundred American cities, he discovered that wherever there was a large membership in these organizations, this proved to be "a symptom of a community of good people of low incomes and of average total welfare."

It was not only writers who came out of the cornlands;

George Bellows sprang from the midwest. Howard Chandler Christy was born in a cabin on a corn title near McConnellsville, Ohio. In Paris, in 1915, Ralph Barton, out of Kansas City, and Thomas Benton, another Missourian, shared an attic studio. What betrayed Barton was the abandonment of his native, corn-fed culture for a pseudo-cosmopolitanism; Benton was loyal to his genius. He has gone back to Missouri, to drive his roots deep into his native soil. Benton and Grant Wood, painter of the Iowa corn lands, represent the American spirit in the realm of art.

The artist, like the corn, is sustained by two sets of roots. One of these needs must drive deep into that which is universal, epic. The other set of roots runs out on all sides, close to the surface of the artist's environment and his time. The permanence of his genius depends upon his ability to develop this double-root system. It may be said that the future of art in America rests on our artists and writers growing like the corn.



XVI

Some American Corn Gods

ADMIRABLE is the account" (so begins the Popol Vuh, which is the sacred book of the Quiché Indians of Guatemala) "in which it came to pass that all was formed in heaven and upon earth. . . . Lo, all was in suspense, all was calm and silent, all was motionless, all was quiet; and wide was the immensity of the skies. . . . There were only immobility and silence in the darkness in the night. Alone was the Creator, the Maker, Tepeu, the Lord, and Gucumetz, the Plumed Serpent; those who engender, those who give being, alone upon the waters like a growing light. . . ."

At that time Tepeu, the Lord, and the Plumed Serpent spake together. At their words light dawned; and with the first day, man appeared.

". . . Tepeu and Gucumetz held council together touching civilized life; how seed should be formed, how light should be produced."

First they made the animals, and assigned to each his place in the earth. But the animals disappointed their creators, because they had no speech. The two said, "Let us make those who shall be our supporters and nourishers." And so they made men.


The first men were made of mud. But these were even less satisfactory than the animals because they could not move about. Tepeu and the Plumed Serpent then made some men out of wood. These could move but they could not think. They stupidly made war on each other and filled the world with trouble. To get rid of them Tepeu caused a great flood.

The few who escaped by climbing to the tops of the trees became monkeys, and their descendants are still with us.

"After this the gods made another attempt. This time they took grains of white and yellow maize . . ." Only yellow maize and white entered into their flesh. These were the sole substance of the legs and arms of man. "Thus were fashioned our first fathers. Men they were. They spoke and they reasoned. They saw and they understood. They moved and they had feeling; men, perfect and fair, whose features were human features."

According to the Popol Vuh there were four of these maize men. These four brothers appear again and again in various guises through the whole body of Mayan and Aztec myth. They are the Four Bacabs who guard the corners of the earth and have charge of the four winds which blow on the corn-fields. They preside over the various parts of the human body, as the Egyptians believed the four sons of Horus did. They represent the four elements of which all things are composed. In a sense, they are the Four Evangelists, also.

All Indian tribes have paid especial attention to the quaternity. When the Navajos perform their Mountain Chant the dancers proceed from a central medicine lodge to the four points of the compass where they scatter maize, water and cornmeal. This part of the rite accomplished, the dancers return from the four points of the compass to the central lodge where the ceremony is continued.

Actually, the pattern of this dance reproduces the ancient Mayan day-sign, *Lamat*  which signified planting, and which was presided over by the Four Bacabs. The similarity between this sign and the hill in which four grains of maize are set to sprout has been pointed out in an earlier chapter. But the sign has another and a far deeper significance than that of a corn-hill. Most certainly this significance was not lost upon those who devised it to express all that is meant by the growth of a seed in the earth. To all races of men, living

at all times, the design of a cross has signified the bringing together of opposing forces. Its central point, where those warring forces meet, is where energy—life—is born. The union of the opposites is a conflict, which generates force. It is, too, the place of reconciliation and rebirth, where a secret transformation is brought about.

Undoubtedly the Maya believed that it was the union of the four opposites which generated the force that caused the maize to grow. More dimly he perceived that something of the same sort must take place within himself for his life to spring up like the young plant. The rituals he performed in the temples of the fertility goddess, and those he performed in the fields where he planted and harvested his crops, were not intended alone for the improvement of the harvest. They were intended to work magic on the individual who performed them. The primitive believed in cosmic law, the same for man as for the plants and the animals. A rite which encouraged growth and productivity in the corn could not fail to be equally good for man, whose body, according to the legend, had been fashioned by Tepeu and the Plumed Serpent out of the white and yellow maize.

The ancient peoples of Mexico and Central America had corn in four colors—white, yellow, red and black. The colors were associated with the different points of the compass, and therefore with the Four Bacabs. The Bacab of the south was called Kan. This was also the name of the day-sign which meant maize. To Kan was ascribed the yellow corn. This was the sacred color, worn by the priests in their temple ceremonies. When Captain Cook visited the Sandwich Islands, he was impressed by the king's ceremonial cloak of yellow feathers. The yellow and white papal banners have the same original significance.

The Popol Vuh is the most striking and instructive of all the myth-records of primitive America. Though it was not written down until after the Conquest, and though its story of

creation has undoubtedly been influenced by the teachings of Catholic missionaries, it presents us with tales told by the Quichés through uncounted generations. The name means literally "Book of the Mat." Its stories are those which were told while the family sat on the mat together. It was entirely natural that many of those stories should be concerned with that which furnished old and young with their daily food.

The four maize men were not the first men on earth. Before Tepeu made men of wood or of clay, at least two beings had appeared with the dawn of the first day. These were the First Father, and Xmucane, the First Mother.

These demigods lived in the green land of Maya. To them were born twin sons. The boys were strong, handsome and skillful in all games. It was they who invented "pok-ta-pok," the game of ball which was played in a paved court, and in which the early Mexicans were amazingly proficient. The ball used was made of solid rubber, about one foot in diameter. Two players stood across the court from each other and kept the ball in continuous motion, each trying to send it through a ring at the end of the opposite court. It was against the rules to use the hands to bat the ball. It must be volleyed from the body. Diego Duran relates that the players he watched had "such dexterity and skill that they, during one hour, succeeded in not stopping the flight of the ball from one end of the court to the other *without missing a single hit with their buttocks.*"

The twin sons of Xmucane were playing this game one day when their laughter reached the ears of the Lords of the Underworld. These promptly dispatched four owls with a message to the brothers to come and test their skill against that of the champions of the House of Gloom.

The brothers accepted the challenge. They bade farewell to Xmucane who stood at the door of her house and watched the owls carry her sons away.

What happened in the Underworld is exactly what one might expect. The Lords fell on the brothers and cut off their

heads. One head they threw away; the other, that of the handsomer twin, they hung on a tree over which grew a gourd vine. It was almost impossible to tell the head from the gourds.

But not entirely impossible. Xquiq, the daughter of the Master of the Underworld, discovered what she thought was the most beautiful ripe gourd she had ever seen. She reached to pluck it when suddenly it spoke, and spat into her hand.

In this miraculous fashion the virgin Xquiq conceived, and was with child by the dead. For six months she hid her condition from her father. Then concealment was no longer possible. The Master of the Underworld was enraged against his daughter, and determined to do away with her and her shame. He called for the four owls and bade them carry her away to the upper world to die. When she was dead, the owls were to tear out her heart and bring it back to him in a little vase he gave them.

The owls picked up Xquiq in their strong beaks and flew with her to a forest in the upper world. They set her down under a tree and took up their places on one of the limbs to watch her die.

"Look," said Xquiq. "It is going to take me a long time to die. I am strong, and there are plenty of fruits here to eat, and water to drink. You will get very tired sitting there on that branch waiting." Then, cleverly, she bargained with them: "I will make a heart out of the gum of the bloodwort. My father will not know it from mine. Carry it back to him in the little vase, and save yourselves a long wait."

The owls saw the advantage of this and agreed to Xquiq's proposal. They took the vase with the bloodwort heart in it, and flew away. Then Xquiq got up and walked out of the wood.

There was a house. A woman stood in the doorway, shading her eyes with her hand, watching the flight of the four owls. It was Xmucane. She saw at once the way it was with Xquiq, and kindly asked her to come into her house to rest.

The princess of the Underworld told her story, and for the

first time Xmucane knew that her sons would never return to her. But the First Mother was a woman of experience. She shook her head when Xquiq told her by what manner she had conceived.

"In this world such things happen very differently. It could only happen so with you if you are a magic-making person. How can I tell that unless I see you make magic?"

"Give me a basket," said Xquiq.

Xmucane put one into her hand.

"Now come and see."

Xquiq went out to a cleared place where maize was planted, and to a single hill. From that one hill she picked so many ears of maize that the basket was filled to overflowing. Xmucane ran and threw her arms around her.

"I know now that you speak the truth. And your son is the son of my son."

To appease the sorrow of Xmucane, Tepeu sent Xquiq twin sons who carried on the tradition of their father and uncle. They are the heroes of countless stories in the Popol Vuh. They too had a magic way of making maize grow where none had grown before. It was told of them, as of Quetzalcoatl the embodiment of the Plumed Serpent, that in their time the maize grew so tall and so strong that a single stalk was all that a man could carry.

One of Xquiq's sons was called Xbalanque, "Jaguar," in honor of the beast which protected the maize by springing on the deer who would have eaten the crop. In many ancient Mexican carvings the jaguar is identified with the maize, as its guardian. The frog was another animal which came in for special honors on account of its supposed rain-making powers. Frogs of gold and of jade have been found in many of the buried temples and tombs. There was a frog of jade, weighing more than ten pounds, and sacred to Coatlicue, which was part of the loot the Spaniards stole. This never reached Spain as the caravel was sunk in the Caribbean. There, supposedly, it still lies with other Mexican treasure.

Jade, which was mined in the southern part of Mexico, was considered sacred to Cinteotl or to the Earth and fertility goddesses by reason of its green color. As for the rain-making abilities of the frog, most of the Indian tribes have believed in them. And most country-bred American children have looked for a rainy day to follow the killing of a toad.

It is easy to see how much of the elaborate worship of the Plumed Serpent and of Coatlicue the Earth Mother was a rain cult, natural enough to tribes whose chief food was maize. The offering of human sacrifices and the shedding of human blood on the altars was intended, through the laws of sympathetic magic, to draw down rain on the earth. The blood served a second purpose, however. It was supposed to nourish the earth and give it strength to produce. Mother Earth was a dragon which would bring forth vegetation only if fed. And the Great Mother was always hungry.

So at the festival held when the maize plant had attained its full growth, when the tassels were forming, women danced before the statue of the goddess shaking their unbound hair in imitation of the waving silk of the maize ears. This, it was believed, would show the corn the way it should grow. One of the dancers in the ballet and trained in the temple dancing-school, was selected for the sacrifice. Her face was painted red and yellow, the colors of the corn. At the climax of the ceremony she was seized by the priest who ripped open her nude body, as one tears apart the sheath surrounding an ear of corn. The still beating heart was offered to the goddess. This, it was supposed, would revive her strength and enable her to bring the maize to its full fruition.

One aspect of the goddess, called Chicomenecoatl, "She of the Seven Maize Ears," presided over the sowing of the maize. On her feast which fell on April twenty-seventh by our calendar, young girls carried ears of corn to the temples to be blessed. There the priests sprinkled the ears with rubber oil to give fertility to the seed.

Chicomenecoatl was also sometimes called "Seven Serpents," doubtless in reference to the rattles which were used in the rain-making ceremonies. Her brother was Tlaloc, the rain-god. This is literally "He Who Makes Things Sprout." The brother and sister lived in Tlalocan, called in the Popol Vuh "The Place of the Division of the Waters." It was that happy isle in the west which figures in the myths of so many peoples, and which always holds the sum of all their desires.

The rain-god was aided in his work by moon fairies and by numberless little dwarfs who carried jars of water to the fields. Clay figures of these "tlaloques," grinning, and holding tiny water jugs, are still made by the Indian potters in our southwest and are offered for sale at the Albuquerque railroad station. I bought one of them there several years ago and set it in a corner of my garden. Whether thanks to the "tlaloque" or to the saint on whom the Pilgrim Fathers pinned their hopes I do not know, but that summer there was no drought in the Hudson River Valley.

The rain-gods had their own feasts when the women baked little cakes of maize paste in the form of serpents and of mountains, and offered these on the altars. At the conclusion of the ceremony, the priests broke the cakes and gave them to the people to eat. Thus, it was believed, they would receive in their bodies the good which the rain did to the fields.

A Mexican manuscript in the Bodleian Library pictures the proper education of a girl. In her thirteenth year—that is, when she has reached puberty—she is to be instructed in the use of the metate-stone. Her entrance upon womanhood is marked by her admission to the ranks of the meal-grinders. From her mother and grandmother she is commanded to learn the ritual for grinding corn for the tortillas for family consumption, and for the little butterfly-shaped cakes to be laid on crossroads altars as offerings to the Haunting Mothers—the spirits of women who have died in childbed.

It seems probable that Chicomenecoatl was a maize and moon deity of the Toltecs who lived in the Valley of Mexico

before the Crane People came down from the north. Her worship persisted for several centuries. Then, gradually, it became fused with that of the Aztec goddess Tlazoteotl, the mother of the maize god.

Like Xquiq in the Quiché legend, Tlazoteotl was a goddess of the Underworld. She, too, was a moon divinity who was associated with childbirth and with witchcraft. Her husband was the god of war. Once a year her priest, dressed to represent Tlazoteotl, his face painted red and yellow like the maize and his mouth black to represent rain, went to the temple of the god of war and lay down before the statue there. Thus was enacted the mating of Tlazoteotl and the war god. Presently another priest, dressed to represent their son Cinteotl, came and stood beside the pair. So, every year, the maize was born.

As queen of the witches, Tlazoteotl rode on a broom. She is so pictured in several old manuscripts. It is interesting that American tribes who had no horses, and no animal to ride, should have imagined the Witch Queen as mounted. And mounted upon the very steed European witches were supposed to ride when they went to their sabbaths.

The German savant Eduard Seler, who is the authority on Aztec picture-writing, says that Chicomenecoatl represented the forces in the growing maize. Tlazoteotl was the ripened ear. The latter's son, Cinteotl, was the maize itself. His name is but a variant of the Mexican name for the plant "teocintl," "Food of the Gods."

Like Persephone and all other grain deities, Cinteotl the son of the Witch Queen was associated with the Underworld. He was male; but the power which produced and sustained him, and which had to be invoked on his behalf, was feminine.

Each Indian tribe in the Americas had its own—and several—legends concerning the miraculous creation of the maize. Roger Williams tells that the Narragansett Indians believed that a crow flew to them out of the southwest with a grain of

maize in one ear and a bean in the other. Therefore the Rhode Island Indians would not kill a crow.

The Iroquois had a legend of a chief of their tribe who prayed to the Great Spirit for more food for his people. He was directed to take his wife and children and go to the plains in the rainy moon, and there to wait for three days. While waiting, the chief and his family fell asleep. When their tribesmen came to seek them they found only a field of green, growing corn.

Mondamin, the maize spirit, figures in the Chippewa legend of the maiden "White Earth," who was sought by five suitors. When she refused the first one, the blanket dropped from his shoulders, and he became tobacco. The second suitor, when he was refused, rolled down the hill and turned into a pumpkin. The third became a melon; the fourth a bean. The fifth suitor was the maize spirit, and him "White Earth" took for her husband.

The Zuñis ascribed the creation of the maize to powers in the sky and the stars. The Cherokees honored the moon as "Mother of the Corn." The Algonquins believed that the moon had two sons, one the White Manitou who created all that was good, including the maize, the other the Black Manitou who wrought evil in the earth.

It will be remembered that Chicomenecoatl was a moon goddess; and Tlazoteotl, who came to Mexico with the Aztecs, was in process of becoming one when the Spaniards destroyed her temples. It is a striking fact that wherever agriculture is developed, the moon goddesses increase in power and importance. Among all the maize-growing tribes in the three Americas, only two had a sun worship. These were the Incas and the Natchez of the lower Mississippi Valley. All other Indians paid homage to the power of the moon.

Like all primitive peoples, the early Americans revered a mysterious, procreating power, essentially feminine in nature, which appeared in the moon and in the earth on which the moon's light fell. This same power was also in woman.

The Zuñis, who maintained a large population in their pueblos by their irrigated and carefully cultivated maize fields, had elaborate rituals connected with corn-growing. At the head of their college of priests was a woman, called the Priestess of Fertility. Other tribes had woman *shamans*, and even the male *shamans* dressed in women's attire for their ceremonies. The good brothers of St. Francis felt it necessary to burn alive a number of these priests and priestesses of the earth before they could establish Christianity in San Francisco. It is interesting that the monks who were so horrified at the Indian *shamans* also had set aside their masculine breeches, and wore skirts like women.

In all the North American tribes women exercised a remarkable power. At marriage, the woman did not leave her home for her husband's. Instead, the husband came to live with her and her parents. The children belonged to the mother. In the Senecas' Long House as many as twenty families lived together. But the women owned the house and all that was in it. A man who made trouble, or who refused to do his share of the work, was promptly ordered out. Father Charlevoix reported of the Algonquins: "The woman never leaves her home, of which she is regarded as the mistress and heiress." About a century before the coming of white settlers, the Cayugas were threatened with extinction in the tribal wars. They sent to the Mohawks and asked for a supply of husbands for the Cayuga women to raise up a new and vigorous generation.

The high prestige held by Indian women could not fail to impress the white colonists. Practically all the early land deeds carry the signatures of Indian women. When the Iroquois met the American representatives to settle the question of their lands, Good Peter spoke to Governor Clinton on behalf of the women of the tribe:

Brothers! Our ancestors considered it a great offense to reject the counsels of their women, particularly of the Female Gov-

ernesses. They were esteemed the mistresses of the soil. "Who," said our forefathers, "brings us into being? Who cultivates our lands, kindles our fires, and boils our pots, but the women?"

Our women, Brother, entreat that the veneration of our ancestors in favor of the women be not disregarded, and that they may not be despised. The Great Spirit made them. The Female Governesses entreat the Great Chief to put forth his strength and to preserve them in peace. For they are the life of the nation.

It is impossible to understand the relationship between men and women in all its rich variety without some knowledge at least of what that relationship has been in their united service to the Earth Mother goddess. For in the very real ritual of sowing, dressing, harvesting and grinding corn, men and women stand in their true relationship to each other and to the earth. The eager desire to return to the soil on the part of many intellectualized city dwellers during the past few years frequently reflects a longing for release from a neuroticism and from a false relationship to each other in which society and economics have enmeshed them.

The whites who came to the Americas from the old civilizations of Europe, brought with them subliminal memories of ancient moon and earth worship. True, that worship had ceased centuries before the new world was discovered. As knowledge overcame ignorance and fear, and as science replaced magic, men had ceased to feel a necessity to bow to the mysterious, fructifying, feminine force in nature. They began to feel power within themselves. As they became increasingly aware of their own intellectual powers, they turned from the moon to the sun, which was their symbol of masculine energy and understanding.

John Smith and those he inspired with faith in America were sun-worshippers, in the sense that they believed in their own powers to deal with the unknown. The Plymouth colonists, and those who gathered around the Reverend Francis Higginson at Salem, had faith in the printed Word of God, in gunpowder and in their own intestinal fortitude to deal with

whatever situation they might find themselves in. God and gumption saved New England from famine, the "salvages," communism and Salem witchcraft. The combination was invincible.

But as the colonists began to push up the Tidewater rivers toward the Back Woods, and westward to the Connecticut Valley and the Housatonic, they removed themselves further from the thought of Europe and closer to the life of the Indian. They came into contact with primitive forces which awoke echoes in their own unconscious. The *genius loci* is a very real presence. That of the corn-growing American frontier led the pioneers to lay aside the concept of woman as the mate of man which they had brought with them from Europe, and to revert to the worship of an older and more primitive woman-image, that of the Mother.

America has a mother-goddess. Her worship was born on the frontier. There Coatlicue, mistress of the cornfields, gave birth to her progeny. There the "Old Woman Who Never Dies," as the Sioux called the moon, demanded of her sons service and worship, even to the offering up of their own hearts. Henry said, "An American Virgin would never dare command; an American Venus would never dare exist." But the American Mother commands with an authority which is vested in all the ancient earth and mother worship of the race.

The women who made the journey on horseback down into the Great Valley, who hoed corn in clearings in the Back Woods while their men were hunting; who held the doors against Indians and their own hearts against fear, were in every sense the mates of their men. They sprang from a Europe which had attained to a concept of women which prompted Frenchmen who believed in the Salic Law to follow The Maid into battle. It had enabled an ill-favored, neurotic British spinster to say, with full confidence that men would accept her statement, "I am England." It was the next generation of American women, born in the tamed and fertile cornlands, who became Mothers.

The American Mother is the last of the maize goddesses. Like all who have preceded her, she demands homage to her maternity. On her feast, which is celebrated annually at corn-planting time, her children pay her tribute in flowers, in specially worded verses invented by the greeting-card manufacturer and the telegraph companies. On occasions she has demanded human sacrifice. The years between 1914 and 1918 revealed a blood-lust in women of all the warring nations which struck terror to the hearts of men. An American infantry officer who was gravely wounded on the Meuse, told me that the greatest horror the war held for him was a woman who caught at his stirrup as he rode through Liverpool on his way to the front. "Rip the living hearts out of them for me," she shrieked. The face and the voice were those of the mother of Pentheus who joyed in the dismemberment of her son. But only in America did mothers who lost sons in the World War adopt an emblem which proclaimed pride in their sons' deaths. American Gold Star Mothers, convening in Paris to go sight-seeing, shop, and visit the army cemeteries, profoundly shocked numbers of European women whose loss by the war had been far greater than that of the Americans.

Men and women of all peoples and of all times have loved the women who bore them. But no other people in world history have enveloped their human mothers in the habiliments of the ancient moon and earth deities. For this we have to thank the American corn.

It is not at all improbable that this bondage to the mother-image is in large measure responsible for the failure of American marriage. The case records of the psychiatrists, family courts and marriage clinics all over the country reveal how far-reaching is the power of the Mother. Scores of folk tales in all the languages of the earth remind man that he cannot achieve a realistic relationship to his mate until he is free of bondage to the mother-image. Americans do not have to seek confirmation of this psychological truth in Arthurian legends

or in the Greek hero-myths. "As certain of your own poets have said . . ."

*At the door on summer evenings
Sat the little Hiawatha,
Heard the whispering of the pine-trees,
Heard the lapping of the water;
Sounds of music, sounds of wonder . . .*

Sounds which the boy imagined to be the voice of the mother who had died in giving him birth. His grandmother, "Daughter of the Moon, Nokomis," brought him up. Her tales helped to build the mother-image in young Hiawatha's mind.

Hiawatha's youth is lived under the dominance of these two mothers, his own and his grandmother. When he reaches manhood, he seeks to escape. True to the archetypal pattern, he conceives the idea that if it were not for his father he could possess his mother—that is, she would be to him like any other woman. She would lose her mysterious, powerful influence. He would be free. Accordingly he seeks out his father and kills him. The same thing happens in a hundred other hero-myths. The prize the hero wins by overcoming his father is his inheritance of his father's strength.

But still, Hiawatha is not free within himself. On his return journey he meets and falls in love with the maiden Minnehaha. Her name means Laughing Water; but to Hiawatha's ear the sounds of the trees and the waters are still his mother's voice. He is unable to give himself to this love because he is still in bondage to the mother-image.

Restless and frustrated, he retires to solitude in the forest. In this sense, he gives himself up to the Mother.

One might think that the hero had now lost reality completely. Not so. Reality comes to him:

*Dressed in garments green and yellow
Coming through the purple twilight,
Through the splendor of the sunset;*

*Plums of green bent o'er his forehead,
And his hair was soft and golden . . .*

It is the maize god, Mondamin. He bids Hiawatha rise and wrestle with him.

*"I, the friend of man, Mondamin,
Come to warn you and instruct you,
How by struggle and by labor
You shall gain what you have prayed for. . . ."*

The author of *Hiawatha* came from a New England which still believed in gumption, if not in God. And in work. It is work which will give the young man the freedom he craves. Work will give him possession of himself.

Longfellow's New England had lost its most virile sons to the western cornlands. They had had to struggle to wrest those lands from the Indians and from the forest. That struggle, coming as it did after their overcoming authority in the form of government by a power outside themselves, gave them their freedom. That generation of Americans possessed themselves in a very real sense.

The real inspiration for *Hiawatha*, I believe, was not merely a Chippewa legend, but what an American poet, born in Cambridge, Massachusetts, had seen happen to his countrymen living in the corn belt.

The sons and the sons' sons of those conquerors of the midwestern cornlands, born on the farms, have not had to struggle in the same way. The fatness of the furrows their fathers plowed fed them and made them rich. As their barns filled to bursting, as their corn and their cattle increased, they themselves lost something. The mother-goddess who fed them so liberally robbed them of their maturity.

Today, American youth, like Hiawatha, which is its symbol, chafes under its bondage to the mother-image, which tends to keep it childish. It, too, conceives of winning freedom by conquering the Father-in-authority. Not an American "Papa." He has never loomed as a power in our national firmament.

And "Uncle Sam" is notoriously a bachelor. But authority in the form of convention, of orthodox religion, of established government, of capitalism. One cannot see and listen to our youthful radicals in the university forums and on soap boxes in Union Square without being reminded of Hiawatha, struggling with West Wind for the power to free himself from the great American Mother.

They will tell you, for so they believe, that it is the existing order of things which holds them in bondage. By overthrowing that order, they say, Youth will come into its own.

One only wishes that it were so easy. Youth never knows what middle age pays a price to discover: that bondage is always within ourselves. Freedom begins in the soul. For our forefathers, the struggle for reality lay in the wresting of lands from savages and the conquest of the fields. Today's struggle lies in meeting the economic problems which are the result of an enormous national, natural wealth. The battle-ground is no longer in the forest and the fields. But no more is it in the legislatures and the courts of law. It is within the soul.

Freedom comes high. Like experience, "it is the price of all that a man hath." For Americans, the price of freedom may well be the sacrifice of the thing we value most—youthfulness. Not in the bodies of our young people, as has happened in the past, and as still happens today; but the childish, dependent state of mind which makes countless millions of us willing to have someone else do our thinking for us.

It may even be that as a people we shall have to grow up.



XVII

Maize Magic in American Folklore

MAG SIX is a granny-woman, little and wizened, deaf as an adder, and with a snake's bright, unwinking eyes. Mag knows things. These are not the sort of things that city people think make a person smart. They are useful things, like how to cure warts, and the right signs of the moon for the planting of gourds and cucumbers and beans; the way to give a child power to staunch blood, and more tricks that will bring rain than just to hang a snake, belly up, over a fence.

To girls who show all the symptoms of being sixteen and lovesick, Mag says: "Take your bed-sheet and go lay it onto the hills where you got your corn planted. You got to do it on the last night of April, though, to make it work. Come morning, that sheet'll be all over wrinkles. Them wrinkles will spell your mister's name."

Mag's mister has been dead for many years. She speaks of him without regret, but also without resentment. "He had a kind of mean streak to him." He suspected—and not without cause, if one can believe Mag's neighbors—that her interest in visiting her sister down the branch was that sister's husband, and he quietly emptied some gunpowder into the corn-cake batter she was preparing to fry. Mag told me about it.

"When I slapped them cakes onto the griddle they went off like Judgment Day." She smiled, like a child remembering a grand and glorious Fourth. "And I hain't heerd so much as a cricket sence."

Mag is frankly suspicious of our doctor's ability to heal the sick. She walked six miles down the valley to see a woman whose little daughter had died a week before of whooping cough. "Efen I'd a known how 't was with the young 'un I'd a been here quicker'n a flea. Efen you'd a slapped a hot corn poultice onto her chest she would 'a been skippin' out there in the yard this minute. A hot corn poultice'll suck out any pizen there is in a body."

Hot corn poultices for coughs and pleurisy and pneumonia; a salve of cornmeal and honey for boils and sties on the eyes; a slice of salt pork, well peppered, bound round the throat in a rag of red flannel for the quinsy and a cornsilk tea for urinary troubles—these are Mag's remedies.

"What's the use o' bein' pukin' an' ailin' when pretty near everything a body needs to keep well is a-growin' right in your own yard?" she says. "These here women with their headache powders and their bottle medicine . . . Shucks. Efen they was to string some corn onto a thread and wear it round their necks like it was beads, they'd be as peart as a day-old chick. There's some folks likes to go doctorin', though."

The hills that wall the valley have held all of Mag's life like a cup. Whatever lies beyond them interests her as little as what lies beyond Judgment Day. All that is the Lord's affair, not hers. But everything that happens to anyone within the valley is of instant and acute concern to Mag Six, in her little two-room, whitewashed stone cottage by the Furnace.

"That measly Sam Hostetter'll land in the County House," she said. "Burns his corncobs."

"What's wrong with that?" I shouted. "You do it. I've seen you throw on a whole apronful to heat up the oven."

"Not my seed corncobs," she snapped. "Catch me putting one of them into the stove. You've got to bury the cobs you take the seed off'n. Or else throw 'em into the branch. Earth's got to have the cobs, same as the seed, to raise you a crop."

"Not worth hoein' corn for" is the worst Mag can say of one of her sex. A man "too lazy to hoe a row" is less than the

dust he refuses to stir. It was Mag who recited for me the ballad of "The Lazy Man." She explained that "rightly, hit oughter be sung." And that the tune to it "was real pretty. Folks useter dance to it when I was a gal." It goes this way.

Come all my good people, and listen to my song.

I'll sing you of a lazy man that wouldn't tend his corn.

The reason why I cannot tell,

For this young man was always well.

He went to the fence and he peeked therein

The chinkey-pin bush was as high as his chin,

The weeds and the grass they grew so high

They made this poor young man to cry.

In July his corn was almost knee-high

Come September, he laid it by.

And in October there came a big frost

And all this young man's corn was lost.

He went to his nearest neighbor's house,

A-courting, as you may suppose,

And in conversation the question came round;

Says she; "Young man, have you hoed your corn?"

The young man made a quick reply;

"Oh no," says he, "for I've laid it by,

It ain't no use to strive and strive in vain,

For I can't raise a single grain."

"Oh, then, kind sir, why do you wish to wed,

When you can't raise your own corn bread?

Single I am, and single I'll remain,

The lazy man I never will maintain."

There are people in the valley who say that Mag Six can hex. "Never heerd me say as I couldn't," she cackles. I have noticed that she invariably draws a five-pointed star across her big

iron kettle when she takes it down for a hog-killing. Mag is always in demand at local butcherings. She is known to be the best casings-maker in the valley.

Everybody knows that a five-pointed star will keep off any hex. There are people who laugh at this and call it a superstition. But not infrequently their barns have stars painted on the gable ends; and whenever the barns are repainted the stars are put on again— Even when the job is being done by a son home from the state college. When Mag whitewashed her corncrib last year she brushed a crooked *hexenfuss* on the door.

“Might’s well be keerful,” she explained.

A lifetime of poverty has made Mag “keerful” of everything that can be eaten. Her “keerfulness” of corn, however, springs from a different source than the thrift which inspires her to find a use for every scrap of pig which falls from the butcher’s knife. Corn is food in a larger sense than just something for tomorrow’s dinner. Her feeling for it is similar to that which makes the Sicilian peasant woman, if she drops a piece of bread, snatch it up and kiss it penitently.

The Mexican woman has this reverence for the maize. If any of it is spilt, she gathers up every grain, lest her carelessness invite want. Before she grinds the corn, she blows on it “to make it live.” Nothing to her mind is a truer portent of bad luck than for her to break the *metate*-stone. Greedy children who beg to lick the *metate* for the sake of the sweet yellow grains that cling to its surface are warned that to do so will cause their teeth to fall out. The same women foretell their luck at the market by dropping a dozen kernels of maize into a jar of water. If all the grains sink to the bottom—as sound corn will do—then the day will be lucky. But if more than three or four float on the surface of the water, then it is best to stay at home and avoid the threatened disaster.

There are few Mexican village homes in which there is a new-born baby where anyone would put a corncob in the fire

without first touching it to the baby's cheek. Not to do this will cause the child to be freckled.

All of the North American Indian tribes made maize medicine. Many of them observed the custom of cutting the umbilical cord over an ear of corn. The ear was carefully wrapped up and saved to be given to the child for his first sowing. The first toy an Indian child played with was frequently a doll made of a corncob with a butternut head, and dressed in fringed husks. These were "gaga"; that is, meant for amusement. But they were also representations of Loose Feet, the friendly spirit which watched over children at play.

The Iroquois, who amassed such notorious corn wealth, held a corn-planting festival each year. Prior to this, the women chose one of their number to be the "corn mother" and to direct the work in the fields that summer. She decided whose field should be worked and planted first, and she saw to the soaking of the seed in a solution of water and hellebore root. When a thieving crow got one of these kernels, he flapped and fluttered drunkenly over the field, to the squaws' derisive laughter.

When the ears were formed, and the kernels were filling with sweet milk, then came six days of Green Corn Thanksgiving. The villagers marched in procession around the fields, carrying armfuls of corn, cakes of cornbread and kettles of corn soup. These were offered to the three spirits of the maize, "our sustainers." At sunset each day there was a feast of roasting ears, roasted pig or a roasted puppy.

The Natchez, living along the lower Mississippi, had a year of thirteen months, each one dedicated to the food eaten during those four weeks and which had been hunted or harvested during the previous month. The year began in March with the Moon of the Deer. After this came in succession:

The Strawberry Moon
The Moon of Old Corn

The Watermelon Moon
The Moon of Fishes
The Mulberry Moon
The Moon of New Corn
The Moon of Turkeys
The Buffalo Moon
The Bear's Moon
The Cold Meal Moon
The Moon of Chestnuts
The Walnut Moon

During the Moon of Old Corn, the last of the last year's harvest was eaten. The Moon of New Corn marked the new harvest, and was therefore, the chief feast of the year.

How good the green roasting ears were the English colonists soon discovered. John Smith enters in his diary under July 1607:

It pleased God to move the Indians to bring us corn ere it was halfe ripe to refresh us.

The newcomers learned how to test the ears by pressing the kernels with the thumb. If no milk squirted, then the corn was already too far advanced for boiling or roasting.

Naturally enough, corn figured in many of the Indian religious rites. Smith's own account of his capture and captivity in the Powhatan's village tells how the medicine man performed a twelve-hour ritual before Smith's fate was decided. First the priest laid a ring of cornmeal around the campfire. Outside this he made circles of grains of corn, laying these in a careful pattern of red and black kernels, and in fives and threes and twos. During the ceremony the priest and the other Indians fasted solemnly.

The Pueblo Indians of the Southwest have developed their maize magic in numerous dances, songs and legends. The dances, which come at appropriate seasons, are intended to encourage the growth of the corn and to frighten away the

enemies of wind, drought and blight that might destroy the crop. The Corn Maiden figures in dozens of Zuñi and Hopi folk tales. The dancers who represent her are masked, or have their faces painted in designs of red and yellow—the colors of the maize.

Interesting, too, is the triangular design which frequently decorates the masks and robes of the “corn maidens.” This is a symbol of the life-giving properties of the maize. Actually, the design is that of one of the ancient obsidian knives carried by primitive Americans, and used by the Aztec priests to perform the human sacrifices in the temples of the earth and corn goddesses. This design of the hunter’s knife has represented food for so many ages that it has come to stand for the corn as well as for meat that is killed to be eaten. This design runs through all the arts and crafts of all the Indian tribes. You will find it in baskets and on pottery, woven into blankets, and embroidered in the beaded garments. It has become a symbol of life.

Few plant forms are found in Mayan art except that of the water plant. This is used to represent the source of human life. There are several pieces of ancient Mexican pottery in the museum collections which are modeled like ears of maize. A Costa Rican jug is shaped like an ear of corn and realistically painted. In the Museum of the American Indian is a bowl of silver found in Peru. The bowl is upheld by three legs made like stubby ears of corn. But this realistic art is the exception and not the rule.

All the early Indian tribes used art primarily in the service of religion, not as an end in itself. The grotesqueness of the Mayan and Aztec gods, as their artists depicted them, was intended to tell the people that the gods were a special creation, apart from men and from the beasts. A deep reverence kept these people from representing realistically that which they considered sacred. It was the same holy fear as that which kept the ancient Hebrews from speaking the name of Jehovah. Even so, in Christian churches all over the world, doves,

eagles, lions, lambs, lilies, grapes, pomegranates, palms and stars symbolize aspects of divinity. Moved by the same spirit, the Indians forebore to make realistic pictures of the Serpent which sent them the rains they prayed for and who was, therefore, their preserver and savior. They conventionalized the serpent into the design which is found all over the world and is commonly called "the Wall of Troy," though ages older than the city Helen's beauty ruined. They represented the maize, which was their chief source of food, as the life-taking and food-bestowing triangular knife. Often too, they pictured the maize as a deer which fed on the crop and so might be considered to have absorbed its spirit. Or as a jaguar which preyed on the deer and so protected the cornfields. The jaguar was a preserver and a savior. The name for the beast was balam. The word also meant priest; that is, one who protects the people as the jaguar protects the corn.

The Maya considered the red-colored corn to be the property of the Bacab who ruled the gates of the East. The Crows gave the ears of red corn a sacred value. These were blessed, and distributed to the tribesmen at the time of planting. The Iroquois called a red ear "chief," and said that anyone who got one was marked for greatness.

The Puritans of New England quickly seized on this superstition and used it as an escape from some of their social repressions. At a husking, whoever got a red ear was privileged to kiss the girl of his choice. If a girl got a red ear she had to single out one of the swains and kiss him before the laughter of all the company. In the Court Records of Long Island it is solemnly entered that at a husking-bee in 1661, "one James Chichester did kiss Bette Scudder." Whereupon Bette, who seems to have been a pert young thing, threatened to "whip his brick." James retaliated with a second kiss and Bette made good her threat. The husking broke up in a scuffle and a scandal. Goody Scudder took the case to court and James was fined two shillings and costs.

Among the Indians, it was the women who husked the corn. Spelman writes admiringly of their skill: "wringing the eares in peises between their hands and so rubbing out the corne into a great baskett." But the English who came to the New World brought with them memories of country threshings and harvest merrymakings in which men and maids worked first and then frolicked together. It is possible that some of them may have heard in the Low Countries or in England a harvesters' song which began as a hymn in Italian churches, but which quickened its tempo as it came up through Spain to the Netherlands. There it lost its piety and acquired doggerel verses in Flemish in which the words "Younker, Yanker, Doodle" occurred many times over. The Flemish harvesters carried it to England and sang it up and down the English countryside as they threshed barley. Cromwell brought it to London. The jeering London crowds who loved a king better than a commoner any day, fitted words to the country air deriding a yokel who came to town and thought himself as good as a king because of the feather in his hat. British red-coats took the air to America. They tried to drum the Continentals out of Boston with its derisive jig tune. It is said that Lord Cornwallis exploded one day, "May I never hear that damn tune again."

He was to hear it played by a band of Continental soldiers as he walked across the grass of a dooryard in Yorktown to hand his sword to the Continentals' Commander-in-Chief.

It is not beyond the range of possibilities that the early New Englanders may have known the tune and that they may have sung it many times as they husked corn.

Husking bees were a regular feature of colonial social life in the rural districts. They were looked forward to all summer. October meant not one husking, but as many as there were farmers in the neighborhood who had a larger crop than the hands in their family could handle. Husking-time was courting time. Many blocks of Boston's Back Bay have been populated as a result of New England huskings. Joel Barlow,

who was the first American poet to win international fame, while in Switzerland gave vent to his homesickness in a long poem in praise of Hasty Pudding. In it he follows the saga of the corn from planting time till the ground meal is turned into pudding. There is a picture of a husking bee:

*For now, the corn-house filled, the harvest home,
The invited neighbors to the husking come.
Where the huge heap lies centered in the hall
The lamp suspended from the cheerful wall,
Brown, corn-fed nymphs, and strong, hard-handed beaux,
Alternate ranged, extend in circling rows.
Assume their seats, the solid mass attack
The dry husks rustle and the corn-cobs crack.
The song, the laugh alternate notes resound,
And the sweet cider trips in silence round.*

*The laws of husking every wight can tell,
And sure no law he ever keeps so well,
For each red ear a general kiss he gains,
With each smut ear he smites the luckless swains.
But when to some sweet maid the prize is cast,
Red as her lips, and taper as her waist,
She walks the rounds and culls one favored beau
Who leaps, the luscious tribute to bestow
Till the vast mound of corn is swept away,
And he that gets the last ear, wins the day.*

Out in the Back Woods, husking bees were not so polite as the one Barlow pictures. It was "corn likker," not cider, that moistened the huskers' labors. A big jug of it was ready for the men as they came, and each one had a long drink before they paired off in sides under two captains. The women folks didn't husk; instead, they prepared the feast which was to come. The main dish at this, according to Dr. Daniel Drake who spent a boyhood in Kentucky during the years just before the Louisiana Purchase, was squirrel pot-pie. Squirrel was an appropriate meat for corn-huskers. Didn't the crows

and the squirrels ravage the outside rows of every cornfield? There was a joke in the Back Woods about the old lady who asked why didn't the farmers plant only inside rows, to cheat the crows and squirrels.

At those Kentucky and southern Ohio huskings the corn would be piled in a high rick in the farm yard. The two captains paced off the length of the rick to find the exact middle. When that was decided on, a second jug of corn whiskey was buried in the corn at that point. Then, at a signal, the two teams of huskers went to it. Any man who got a red ear was entitled to a pull at the corn-likker jug which had greeted them. The team which reached the middle of the rick first won the jug buried there. The captain was lifted to the shoulders of his team and carried triumphantly about the farm yard, jug in hand.

Then came the supper, and after that it was time to bring out the fiddles for "Old Dan Tucker" and "Sourwood Mountain." The harvest moon would be going down by the time the huskers started for home, to be in time for the morning milking.

"Leave out the corn fairies, and there wouldn't be any corn. . . ."

Apparently these American fairies had to wait for their story to be told until a boy should be born in the corn belt who had hearing and sight that extended beyond the corn-hog ratio and yields per acre.

A lot of people have heard the corn growing. Practically anyone can hear this on a clear, hot July day. But not everyone has seen a corn fairy. Carl Sandburg has, though. The best time to catch one of them, so he says in his *Tales of the Rutabaga Country*, is "when the harvest moon comes up red as blood early in the evening." Then, if you are very sharp-eyed, you may see the corn fairies sitting cross-legged and sewing the clothes they have to wear next spring and summer.

How can you be sure that they are fairies?

Listen.

When a corn fairy sews, he always points his big toe slanting toward the east. It's an infallible sign.

And if you do see one of them, and the adventure goes to your head a bit, so that you are no longer quite sure where you are, or what direction you are traveling in, here is the way to get your bearings. Just look closely at the number of stitches the corn fairy is putting into his sewing. "In Illinois, the corn fairies stitch fifteen stitches of ripe corn silk across the woven corn leaf cloth. In Iowa, they stitch sixteen stitches; in Nebraska, seventeen stitches. And the farther west you go, the more corn silk stitches the corn fairies have in the corn cloth clothes they wear."

With a safe rule like that to go by, nobody need ever get lost. At least, not in the corn belt. So, if you look when you drive by a cornfield when the harvest moon comes up, and if you listen, "maybe you will hear the corn fairies going pla-zizzy, pla-zizzy, zizzy, "softer than an eye wink, softer than a Nebraska baby's thumb."



XVIII

Old Daddy Flicker Likes Corn Likker

IN THE first half of the eighteenth century this country received a sudden transfusion of new blood. Half a million Ulster folk poured into the ports of Philadelphia, Baltimore and Charleston and took the roads to the western frontier. They were by nature hardy and hot-headed, invincible in purpose and unrestrained in passion. Their generosity to a friend was only equaled by their zest in hating an enemy. They had, according to Justin Winsor, "that excitable character which goes with a keen-minded adherence to original sin, total depravity, predestination and election."

They were whiskey drinkers and whiskey makers. In Scotland they had distilled their liquor from barley. Transplanted to northern Ireland, they had carried their pot-stills with them.

The wild Irish who watched them come in to possess the good farmlands from which the Sassenach had driven them into the bogs of Connaught, grinned at the sight. Was it the way it was these Scotchmen thought they could teach an Irishman to make poteen? Hadn't they, themselves, been at it since before ever time began? And wasn't it an Irish saint, no less, who sailed his coracle up the Firth of Forth and generously instructed the poor heathen Scots in the civilizing art of distilling barley into usquebaugh?

The newly-planted Scots found to their delight that the glen waters of Antrim and the springs which fed the Liffey were as potent in drawing the spirit out of the fermented barley and oats as the burn waters of their native land. They

found, too, another good in Ireland which they had lost in Scotland. The Crown's exciseman was not so diligent. For years a whiskey rebellion had been grumbling under the surface of political life in Scotland. The farmers resented the government's tax on the grain which they chose to distill and not to grind. "The gauger," they called the unwelcome collector of excise. They were not above taking a shot at him from the heather.

But the Crown was lenient toward the Scotch who were helping in the conquest of Ireland. If having their own stills and making their own whiskey would encourage them to stand against the Catholic Irish, why the loss in excise was less than the cost of keeping British regiments in the Pale. For a century the Ulstermen made whiskey and smuggled quantities of it into England. There were connoisseurs in London who preferred the smoky flavor of Bushmills to the "King's whiskey" made in licensed distilleries at home.

Before their one-hundred-year leaseholds had run out, something happened to the Scotch in Ulster. It may have been the whiskey distilled out of Irish water and Irish grain which effected a metabolic change. Those transplanted Scots took on certain distinctly Irish characteristics which turned them into a problem to the Crown and the Parliament. They even expected the government to keep its word about protecting the Irish linen industry. When it did not, with really Irish effrontery they proceeded to make trouble. And when that trouble did not bring the relief they wanted, and their leaseholds ran out, they set sail for the colonies in America.

Froude estimates that "in the two years that followed the Antrim evictions, thirty thousand Protestants left Ulster for a land where those who sowed the seed could reap the harvest."

Few of those who came remained in the cities. They wanted freedom and they wanted land. They pushed on to the frontiers in the Berkshires, to western Pennsylvania and down through the Cumberland valley into the Back Woods of Virginia, the Carolinas and Kentucky. How much of the spirit

of our westering frontiers came out of the worms of the stills which these Ulster whiskey makers set up in lean-tos beside every cabin along the ridges of the Alleghenies is a nice matter for conjecture. The backwoodsmen themselves did not hesitate to pay tribute to their "corn" any more than the British seaman withholds honor from the grog which stood by him at Cadiz, Trafalgar and Jutland. "Corn likker" manned many a stockade in the days when the Shawnees were harrying the frontier settlements. It kept many a scout alive on the trail. It brought more than one woman through a difficult and unattended childbirth. It fought off snake poison, country distemper and the fatal "yaws." Scores of ballads and fiddlers' tunes flowed from little brown jugs set out at weddings and "swing-arounds."

*Old Daddy Flicker
Likes corn likker.
He picks up his feet
Quicker'n' quicker. . . .*

More than one circuit-riding preacher took his fee in "corn likker," which was as good as cash money at any crossroads store in the mountains. You could no more have persuaded those indomitable servants of the Lord that they sinned in exchanging the Word of God and a Christian funeralizing for Kentucky corn whiskey than you could have made Martin Luther believe the devil made Rhine wine.

In Pennsylvania rye was a plentiful crop. The Ulster folk who settled in the Kittatinning Valley and on the York "barrens" promptly fermented this for use in their stills. Where rye was not so plentiful, a formula of two parts corn to one part rye was followed. American corn was found to contain more starch—and therefore more spirit—than any other grain. Its disadvantage was its weight, which tended to make it sink to the bottom of the mash tub, and slowed up the process of fermentation.

There was nothing new in the idea of fermenting corn. The

Indian tribes had made various intoxicating drinks from maize which they used in their religious ceremonies and dances. In ancient Peru the natives made "sora" which was so potent that the Inca forbade it to the common people. Today, "chica," a kind of maize beer, is the common drink in that country. Its manufacture is primitive, to say the least. Old women, squatting in the sun, chew maize kernels to pulp and spit them into jars of brackish water. By the natural process of fermentation, this becomes beer. Probably the liquor which Columbus reported the Indians of Veragua made from maize was brewed in much the same fashion.

The English who came to the early settlements in Virginia and Massachusetts imported malt and used this with the native corn in the making of beer. Jamestown had a brewery. There were a brewery and a malt house on every large plantation in the Tidewater, although the planters' own ships brought rum from the sugar islands, and French and Spanish wines from Europe.

American beer was plentiful and cheap in Massachusetts. A quart for a penny was the legal price; and a fine of ten shillings hung over the taverner who charged more than this, or whose beer fell below the standard of quality. Cotton Mather complained that every other house in Boston was an ordinary. The Puritans may have been ferocious moralists, but they were no teetotalers. They knew that the inner man had to be fortified against the rigors of a New England winter. And they had no great faith in spring water. The best that the author of *New England Prospects* would say of it was that "any man would choose it before bad beere, or before butter-milk or whey." Frequently the village baker was the brewer as well. One industry supported the other. President Dunster, the first head of Harvard College, petitioned the County Court that "Sister Bradish be encouraged in her calling of baking and the brewing of penny beer, without which she cannot continue to bake."

One is inclined to speculate on the effect on the Puritan

metabolism of the drink called "whistle-belly-vengeance" which a tavern-keeper in Salem is said to have invented. It was made of sour homemade beer, simmered in an iron kettle with molasses and brown bread crumbs, and drunk piping hot. Or of flip, made of homemade corn and rye beer, sweetened with molasses, laced with Massachusetts rum and beaten to a bitter-tasting froth with a red hot poker. There may have been a burning hunger and thirst after righteousness at the pit of the Puritan stomach, but one suspects acidosis.

The seventeenth century found it easy to believe in witchcraft, eternal damnation and the capacity of the human frame to stand anything. Mothers were advised to see that their sickly children got their feet wet every day in cold weather, to harden them. Also, they were recommended to feed the young on cheese, brown bread and warmed beer. It is probable that the two prescriptions balanced each other. At least, those who escaped death by pneumonia had no lack of vitamins A, B, C, D and G on which to perpetuate the Mayflower posterity.

When the apple orchards which the New England settlers planted almost as soon as they set their corn came into bearing, maize beer declined in popularity beside cider. An ale-quart of cider, sweetened with molasses and spiced, cost a groat in any tavern. On the frontier farms, as soon as the apple harvest was gathered, an "Indian barrel" was prepared and set ready with a gourd dipper for red-skinned visitors. Sometimes the callers brought a trapped patridge, a piece of venison, or a basketful of corn to offer in return for the drink. Often the "Indian barrel" was a bribe. Its contents were the price of immunity from attack during the treacherous days of balmy weather after the first frosts. Then the savages frequently descended upon the frontier settlements for a last foray before the deep snows. "Indian summer" was a fearsome time for the pioneers.

The distilling of cider into applejack took place on hundreds of farms. Just as the distilling of molasses into rum was car-

ried on in all the towns near the seaboard. Massachusetts rum, at two shillings the gallon, made up in cheapness what it lacked in quality. Most of the colonies placed a tax on the distilling of spirits; but this was not so heavy as to discourage the distillers, or to make the exciseman's task dangerous. Though always there was a natural inclination to do the government out of its revenue from stills whenever possible. The little stream which runs through the town of Portchester, and which is the dividing line between Connecticut and New York was named "Buy Rum River." The local distiller had his pot-still set up so he could move it from one bank to the other depending on the side from which the hated exciseman approached.

Colonel William Byrd of Westover was the greatest planter on the upper James River. His father's caravans to the Cherokees had brought back pelts which sold in London for good round sums. Westover tobacco, carried to the same market, gave the Byrds a fine credit on the books of British merchants. And Westover corn, pork, lard and beef cattle were sold in the West Indies for molasses, sugar and rum which brought good prices in the colonies.

As a boy, Colonel Byrd had talked with the scouts who led his father's pack-caravans. As a young man, he had made the journey with them over the mountains and down into what is now the state of Tennessee. If any man in Virginia knew that wild country, it was he. Accordingly, the governor appointed him chief of the commission to settle the vexing problem of the dividing line between Virginia and Carolina.

William Byrd—to the day of his death he took pleasure in the fact that admirers of his elegance called him the "Black Swan"—made the trip down to the Dismal Swamp and beyond with the dignity of a king's messenger. What he saw on that momentous journey, and what he reported to the governor, fill two volumes. They are the first contribution to American literature. One, the official *History of the Dividing*

Line, describes that section of Virginia's frontier and the settlers along it. Many of these were runaways from Maryland and Virginia, ne'er-do-wells and idlers, evaders of justice. Many were descendants of the indentured servants who had served their terms, and then moved out to the Back Woods. The Black Swan found them a rag-tag, bobtail crew; shiftless, dirty, illiterate. Their custard complexions told of malaria, country distemper and other ills due to a constant diet of pork without salt. Their "Indian corn," he reported, "is of so great increase that a little pains will subsist a very large family with bread."

Much of that corn went into whiskey which was their remedy for snake bite, hookworm and all other miseries.

Pushing farther into the mountains, Colonel Byrd encountered the advance tide of the Ulster immigrants who were flowing down into the Great Valley from Pennsylvania. These too, he noted, had brought their stills with them. Lacking mills, they had made for themselves rude querns with which they also ground the sprouted corn for the making of "corn likker." They brought with them, too, their home-made fiddles, their Scotch superstitions, ballads, and their Gaelic gift for ballad-making. Away in the coves of the mountains they perpetuated a folklore and folkways that were passing from the British Isles. They had the Gael's enjoyment of a wake or a burying, and saw to it that the corpse was toasted on his way to the spirit world in powerful, clear white "corn likker."

To that "corn likker" we owe the second volume of the Black Swan's *History*, which is no less than an unblushing account of his and his fellow commissioners' sexual adventures on the expedition. Some of the exploits are worthy of the author of *Moll Flanders*. That the Colonel enjoyed the experience is proven by his purchase of twenty thousand acres in western Carolina which he named his "Land of Eden." Part of this he proceeded to sell to the Ulster immigrants as they came down the valleys from the north. Later, when many Scotch

who had been sympathizers with the Stuart cause came out to Carolina, these too moved westward into the Black Swan's Land of Eden.

It was truly the land of "corn likker." The steeply sloping fields, many of them three to four thousand feet above sea level, would grow corn and little else. Before the rich humus in the top soil was eroded, the returns per acre were exorbitant. But there were no roads by which the grain could be carted to market. And no carts to take it in. There were only rude trails which could be ridden on a horse, with saddlebags; or walked, with a tow sack slung over one's shoulder.

Roots of the wild ginseng were toted that way to be traded at the nearest country store for gunpowder, salt and calico. Ginseng brought fabulous prices in China. All sorts of magical properties were ascribed to it. The Black Swan took to chewing a bit of it on the trail for the enthusiasm it gave him. "It chears the Heart even of a man that has a bad Wife," he wrote. But four bushels of corn were all that a horse, or a mule, could carry on the mountain trails. That amount of grain was not worth the trip to the trader's store. But the same pack animal could carry two eight-gallon kegs of "corn likker," slung one from each side of the saddle. Sixteen gallons of whiskey represented eight bushels of corn. At twenty-five cents the gallon, the trip over the mountains paid.

It was not moral depravity which made the Scotch-Irish settlers in the Back Woods whiskey distillers, but economics. And it is economics, not lawlessness, which has made them and their descendants rebel against the excise on spirits whenever this has been imposed heavily, and take to "blockading."

When corn sells at twenty-five to forty cents the bushel, a man quickly sees the advantage in distilling two bushels of corn into four gallons of whiskey which, thanks to the high price of the legally distilled product, are tradable at any country store in the mountains for four dollars worth of groceries.

During the Revolution, and after it, there were farmers

throughout New England who found it paid better to distill their corn and rye than to carry the grain to market. There was a demand for whiskey. During the war years, the importation of rum and molasses had fallen off. Both armies bought spirits for rations. And the soldiers of both armies were not unwilling to trade gunpowder, blankets or a musket for a gallon or two of American whiskey.

John Adams complained of the dissipation which spread over the New England states, and of the number of stills being operated in Massachusetts and Rhode Island.

In western Pennsylvania, distilling had become the most profitable branch of farming. A one-hundred gallon still was reckoned to be worth a two-hundred acre farm—and this within ten miles of Pittsburgh, which was the capital of the whiskey trade. A traveler along that part of the Back Woods reported that it was hardly possible to be out of sight of the smoke from a still. Monongahela Rye was shipped down the rivers to New Orleans. The usual price was twenty-five cents the gallon—including the jug. German potters did a thriving trade in making demijohns. Meanwhile "Old Monongahela" was achieving distinction in Philadelphia and New York where the merchants were not ashamed to fill their decanters with it at forty cents the gallon. The New England rum importers and molasses distillers began to grumble at the competition offered by this "Back Woods liquor." How were their ships to pay if American farmers were going to distill spirits from American-grown corn and rye, and sell their product for less than the price of rum?

Washington had every reason to know that the Scotch-Irish farmers in western Pennsylvania and down the mountain valleys would defend their right to distill their corn and rye before selling the crops, as passionately as they had defended the forts along the Ohio frontier. These backwoodsmen had formed the first regiment of foot soldiers enrolled by Congress. They were the first outside colonists to assist New England at the siege of Boston. They had made history, and won

the reputation of being Washington's favorite troops, at King's Mountain, Saratoga and The Cowpens. The war won, they had gone back to their farms and to the lands which they had taken as pay for their services in the war; to their keel-boats and fur-trading. Their backs were to the eastern cities, their faces to the new west.

On their farms the still was as important as the barn. The crop of corn and rye was not harvested until the meal had been mashed and distilled into "juice," which could be carried on horseback to the traders. Small boys put in hours at the "armstrong machine" which was the Back Woods nickname for the hand mill, grinding sprouted corn to be ready for the mash tub. The teacher and the preacher were frequently paid by the gallon.

Washington had every reason to know what Jefferson knew, and said bluntly, that Hamilton's proposal to place a federal excise on distilling was to make a bid for trouble. It was to legislate against the farmers in favor of the New England ship-owners and their imported rum. True, the various colonies had taxed spirits during the Revolution, and during the French and Indian troubles which preceded it. The farmers had paid those taxes without grumbling. But a federal tax, for a purpose beyond the understanding of most of those who would be called on to pay it, would seem to undermine the very principle on which the Revolution had been fought.

Only four years before, a Scotch-Irish farmer on the Berkshire frontier in Massachusetts had led eight hundred other disgruntled farmers against the merchants and bankers whose power in the state legislature overweighed that of the land workers. Daniel Shays had sold the sword which Lafayette presented to him for what it would bring, to try to save his farm. He and his farmers had demanded a moratorium on farm debts, which had greatly increased during the war and during the period of deflation which came afterward. His revolutionists had prevented the Court from sitting on the debt cases. There had been the beginnings of a nice little war in

western Massachusetts, and the arsenal in Springfield had been burned before the militia could restore order. Shays and many of those who sympathized with him had left their overburdened farms for new land in the Genesee Valley and in Ohio. They had turned New England over to the merchants and the manufacturers.

Would something of the same sort happen in the Back Woods if an excise were levied on whiskey?

"Let it." Hamilton dismissed the Back Woods with a snap of his fingers. "We have the militia to enforce the law, and to collect the tax on stills if necessary." It is not to be forgotten that Hamilton came from the rum-exporting sugar islands.

The law went into effect in 1791. The tax on whiskey amounted to seven cents the gallon. But that additional seven cents gave New England rum a commercial advantage. The excise discriminated against American grain in favor of imported molasses.

Shouts of protest came from the Back Woods. What was the government in Philadelphia trying to do? Ruin the Mississippi River trade? And the fur trade in the Northwest, where whiskey paid for pelts? Where there were no roads, a man had to distill his grain to get it off his farm. Albert Gallatin protested for the Pennsylvania farmers: "We have no means of bringing the produce of our lands to sale, either in grain or in meal. We are therefore distillers through necessity." And he pointed out that farmers in the East were able to sell their corn and rye for higher prices than the western farmers could get for their whiskey. Farmers in Westmoreland County, Pennsylvania, got up a petition. "Why," they demanded, "should we be made subject to a duty for *drinking* our grain, more than for eating it?"

The law struck at the very roots of that independence which had made the Scotch-Irish leave Ulster for the colonies. They had fought for that independence during seven years of war. They would go on fighting for it. And they did.

For four years the resentment against the tax on stills, and

against those who tried to collect the excise, rose. In Virginia and the Carolinas and in Kentucky very little attempt was made to collect the duty. In those states the farmers' whiskey did not offer serious competition to the stock which the merchants imported for sale, or the products of the commercial distillers. But in Pennsylvania whiskey-making had assumed the proportions of a major industry. The excisemen reported that the farmers refused to pay the tax. When the exciseman threatened them with the law, they leveled their rifles at him and told him curtly to "get going." One or two obstinate collectors who did not go quickly were tarred and feathered.

Despite the law, the settlers in the Back Woods went on with their distilling. They even boasted of it when some of them came together at "The Whale and the Monkey" or "The Green Tree" in Pittsburgh. "Black Betty," as they affectionately called the whiskey jug which stood on a shelf in every cabin, became the toast of the Back Woods. They made ballads about her, and sang them; as well as ribald ditties about "the gauger" and his dishonorable intentions toward Black Betty.

Those farmers who paid the tax on their stills became the object of the "Whiskey Boys' " revenge. Bands of them, with blackened faces, rode about the country and destroyed stills on which the tax was paid. One night a company of them marched into Carlisle, and when the citizens retired into their houses and bolted the doors, they set up a tall pole in the square. A board nailed to it proclaimed

LIBERTY AND NO EXCISE

OH, WHISKEY!

General Neville was called on to enforce law in Pennsylvania. When a company of farmers called on him to protest against this intrusion on their rights as citizens, he ordered his soldiers to open fire on the crowd. Five farmers were killed. A few days later, five hundred "Whiskey Boys," many of them armed with the rifles they had carried during the war, and led

by Tom the Tinker, burned the General's house. He fled, and his guard surrendered.

In Philadelphia, Washington bit his lips and determined to crush the rebellion by force. He himself at the head of fifteen thousand militia marched to Pittsburgh where the rebels, now five thousand strong, were encamped. They had taken over the city. Terrified citizens carried supplies from their cellars and storehouses to the camp on Braddock's Field. Judge Brackenridge loudly lamented the four barrels of old prime Monongahela he had had to surrender before the militia put the rebels to rout.

The bill for quieting the Whiskey Rebellion amounted to one-third of the governmental expenditures for that year. And yet illicit distilling was not done away with. Disgruntled, many of the Pennsylvania whiskey-makers moved farther south where the excisemen were not so diligent. Many crossed the Ohio into the new frontier. They took their stills with them, and set them up wherever they grew their corn.

The Scotch-Irish who took up corn titles in Kentucky built the first distillery beyond the mountains. This was in Louisville, in 1783. Kentucky has been making whiskey out of corn ever since. They say Kentucky colonels are weaned on Bourbon.

This type of whiskey, made from a mash which is predominately corn, leads all whiskeys in popularity in the United States. Only 5 percent of the total whiskey sales in the country are of Scotch. And 20 percent of those are in and around New York City. Rye is more generally popular. But America's consumption of Bourbon is two and a half times that of Rye.

America drinks corn.

The source of the alcohol in whiskey is the starch content in the grain, whether it be corn, rye, wheat or barley. The advantage of corn over all other grains is its high percentage of starch. The more starch extracted, the greater the yield of

alcohol per bushel of grain mashed. In order to get all the starch content in solution, the grain must be finely ground.

To make Bourbon whiskey, the ground corn meal is weighed and dropped by gravity into the mash tub which is partially filled with warm water. As the meal goes in, an "agitator" keeps stirring it while the temperature is raised slowly to about 212° F. The heat and the stirring process cause the particles of meal to disintegrate. The granules of starch burst open, releasing the starch so that this can be readily converted into the fermentable sugars.

Next, the corn mash is cooled somewhat, and a mash of rye meal which has been separately prepared is added to it and stirred. The starch in the rye disintegrates more readily than cornstarch does. Therefore this is accomplished in a short time and at no increase in temperature.

Third, a mash of barley malt meal in cold water is added. This brings the temperature of the mash to approximately 145° F. The combination of meals is stirred for thirty minutes or so, until chemical tests indicate that the diastase in the malt has converted all the starch into fermentable sugars. After this, the mash is cooled and pumped into tubs for the fermenting process.

Yeast, water and some of the thin effluent from the stills—what the old distillers used to call "returns"—are added to the mash in the fermenters. At the end of the fermenting process, the beer—the name given to the product at this stage of its development—is discharged through a valve at the bottom of the fermenting tub into a reservoir which is connected with the still.

The beer has an alcoholic content of approximately 4.5 to 5.5 percent by volume. In the still, this alcoholic content is concentrated into whiskey.

Most distilleries use the continuous still for the production of Bourbon whiskey. As the name implies, this type of still receives a continuous feed of beer, and has a continuous discharge of alcoholic distillate and slop.

Briefly, the pre-heated beer is led into the still near the top, and flows down over a series of copper plates which are heated by vapor coming up from below through perforations in the plates. By the time the beer reaches the slop chamber at the bottom of the still, all its alcoholic content has been exhausted. The spent beer is discharged, screened and dried, for sale as cattle feed. Meanwhile the vapors rising from the top-most plate in the still are led off into a condenser.

In the making of Bourbon whiskey, the spirit removed from the beer in a continuous still runs from 90 to 100 proof. The first distillate, or singlings, is then passed through the doubler and redistilled. During this doubling process the distiller determines the amount of "heads and tails" that are cut off. The Government requires that nothing above 160 proof be called whiskey. Usually the whiskey goes to the cistern room at from 115 to 159 proof.

This high-proof spirit is reduced to not less than 100 proof by the addition of distilled water. It is then put up in new, charred, white-oak barrels for aging. In its raw condition, when placed in the barrels, the whiskey is colorless, and has an unpleasant taste and odor. During the aging the liquor takes on color, the unpleasant odor and taste disappear, and a new product is born. These chemical and physical changes occur slowly, requiring time for their completion.

Under the provisions of the Bottled in Bond Act, whiskey cannot be bottled in bond and carry the precious green government stamp or the statement on the labels until it has been in charred oak barrels for a period of at least four years.

Under our present laws, all steps in the process of distilling, from the weighing of the grain to the final bottling after it has been aged, are supervised by agents of the U.S. Internal Revenue Service.

"Corn likker," as made in the Kentucky and Carolina mountains in a pot-still, or even in a soap kettle with a barrel inverted over this to condense the vapor from the fermented corn mash, and drunk within a week is, according to Irving Cobb,

"an illegitimate orphan of the royal line." White mule is its appropriate name.

It was corn whiskey—either honorable Bourbon or native white mule—which filled the Log Cabin bottles that promoted William Henry Harrison's campaign for the presidency. The cabin, and the whiskey distilled from corn, symbolized the traditions of the American frontier. Ohio Republicans shouted their campaign song:

*Where, oh, where, was your Buckeye cabin made?
Way down yonder in the sylvan shade.
Where the Buckeye boys wield the plough and spade,
There, oh, there, was our Buckeye cabin made.*

The inference was that a vote for Harrison was a vote for corn whiskey, and plenty of it, for everybody.

One can no more tell the story of the lower reaches of the Mississippi and leave out "corn likker" than one can write of France without its vineyards. The French settlers, with their violent dislike of corn, distilled brandy from peaches and grapes, and even brewed beer from wild persimmons. In all the French villages it was the custom to keep the festival of the patron saint with a local celebration. The Scotch-Irish Protestants who settled Kentucky and Tennessee, not to be outdone by their Catholic French neighbors, canonized a saint of their own. St. Tammany's original was an Indian chief. But his "Day," on the first of May, was kept as enthusiastically as if he had had a place in the church calendar. At Louisville they held a shooting match, greased pig races, barbecues, and dances around a decorated Maypole. Kegs of Bourbon and jugs of mountain "white mule" stood about within easy reach. When it came to dancing "Sugar in the Gourd" or "The Rattlesnake Shake," the corn juice limbered one up, and inspired fancy steps that made the Negroes on the edge of the crowd stare and gasp admiringly.

The river's rambunctious days, when the keel-boat men

fought and raced each other, when the logs from the Illinois forests jammed the levees in New Orleans, when Tom Lincoln's big, gawky son floated his pirogue down the river for a look at the French and Spanish folks down on the Gulf, were wet with corn whiskey. Mike Fink, that legend among the keel-boat men, was a "corn-likker" hero. So too, in their way, were the "Tennessee alligators" who followed Andrew Jackson to New Orleans. Long years afterward, their leader said of them: "I had a lot of fellows that could fight more ways, and kill more times than any other fellows on the face of the earth." Each "alligator" had a canteen on his hip. These were filled with a colorless liquid. But it was not water. As for Davy Crockett, who could wink a coon out of a tree, and who, reputedly, rode a wild razorback all the way from Fayetteville to the Gulf,

"Why, thar hain't a man alive could 'a done that, 'thouten he was plumb full o' corn likker."

One of Jefferson's first acts as President was to bring about the repeal of the excise. In 1807 an embargo was placed on the importation of spirits from abroad. The number of stills in the country greatly increased.

But as roads were cut through the country, and then railroads, as mills and refineries were built which ground corn or turned it into starch, as the towns grew up and turned to the surrounding farmlands for food, the farmers ceased to distill their grain. They no longer had to do this to buy tools, clothes and groceries. Only when the excise was raised again during the Civil War, and the price of whiskey went up to carry a federal tax of two dollars per gallon, the farmers in the Back Woods got out their stills and went to blockading. It was a high federal tax which made the market for "moonshine."

Another market was created in states which had dry laws prohibiting sales of spirituous liquors; but not, in those days before Interstate Commerce was regulated, against the shipment of liquor into those states by express. The mail-order

whiskey business boomed. More than one man in the corn belt bought corn and rye cheap, and distilled it for sale in Maine and other dry states. A lot of them got rich on the profits.

One of these "mail-order distillers" developed a sales technique to make modern advertising men gasp in amazement. He had a mailing list of likely prospects in various dry areas of the country. By experience it was found that ministers, Church deacons and merchants whose wives were prominent in W.C.T.U. circles had the least sales resistance. A letter was sent to each person on the list telling the merits of the firm's "Number One," at four dollars the gallon, by express collect. A plain wrapper was promised. "Impossible to detect from maple syrup."

A month later, those on the list who had not sent in their U.S. postal money orders for four dollars received another letter which extolled "Number Two," at two dollars and a half the gallon. Actually "Number One" and "Number Two" came from the same vat. "Number Two" also could be sent in a plain package.

Thirty days after this broadside, all those who still showed sales resistance received a letter from Pioneer Gray. A picture of the pioneer, wearing a sixteen-inch beard and a fringed buckskin shirt, and leaning on a long-barreled rifle, adorned the letterhead. Pioneer Gray wrote in a forthright, folksy style. He reminded his correspondents that his pappy had made right good corn whiskey, and he continued to uphold the family tradition. The products of Pioneer Gray's still sold at one dollar the gallon.

When the originator of this sales plan died, he left a fortune amounting to close to six million dollars, all of it gathered in by mail.

Some time during the late seventies, an agent of the Internal Revenue Service reported that there were no fewer than three thousand stills, of a capacity of from ten to fifty gallons a day, being operated without a license in the southern mountain

region. These stills were supplying "blockade" to farmers and storekeepers in the Piedmont areas on both sides of the Unakas, the Great Smokies and the Blue Ridge Mountains. Immediately the revenue officers began the work of locating those stills and destroying them.

And a chapter was added to American folk history.

It was their "corn likker" which brought the southern mountaineers to the knowledge of the great majority of Americans. Stories of fights with revenuers, of feuds which set one county against another, of extraordinary customs and beliefs, came to light. For forty years and more, these became the basis for novels, plays and motion pictures. Radio put the "hill-billies" on the air, and Americans woke up to the fact that they had a national folk song.

Meanwhile, various religious and educational movements were started to raise the cultural level of these lost Americans. Berea College, in Kentucky, was one of the first. There, it was hoped, the mountain boys and girls would have a better start in life than their parents had had. In Georgia, Martha Berry opened her school with the largest campus in the world—a whole state. The young "corn crackers" slid onto the schoolroom benches and took up the blue-backed spellers and learned to read. In the school farms they learned to grow vegetables to vary the inevitable mountain diet of "yellow bread and sow-belly." It was hoped that they would learn to look with disfavor on "moonshine," which completed the mountain corn trinity.

Prohibition started the mountain stills going again. It created new markets for "blockade." Lazy little curls of hickory smoke rising from a laurel thicket on some remote hillside were all that told that three or four men had climbed there with sacks of corn to be distilled. Always, the still had to be set close to running water. Often it was the run that gave away the secret. A cow or a pig will drink water that has "slop" in it. A horse will not. Mounted revenuers had an advantage over those who rode in Fords.

Repeal took away the market for "blockade," except in localities where men have never drunk any other kind of whiskey. One of them derided the idea that whiskey improved by ageing. He had tried it once, he said. "I left the jug for all o' three months. Danged if I could taste any difference."

In parts of the Great Smokies and the Ozarks a man just naturally makes "corn likker" for his own use, as he salts down white meat and smokes a few hams. It's a matter of thrift. He can't eat all the corn he raises. He has to drink some of it.

At many of the Ozark swing-arounds there's a jug of corn set out in a convenient corner. The mountain women do not drink in public, but there is no convention which prevents their partners from gathering around the jug and its gourd dipper between the dances. The fiddlers have a jug of their own. When the dancing is well under way, and the blandishments of Black Betty have had their effect, the dancers are apt to break into the song which goes with the tune they are stepping to:

*"What blood? What blood on the p'int o' your knife,
Dear son, come tell to me?"*

*"Hit's the blood o' my old gray horse
That ploughed the corn for me."*

That ploughed the corn for me!

*"What blood? What blood on the p'int o' your knife,
Dear son, come tell to me?"*

*"Hit's the blood o' my old Guinea sow
That et the corn for me."*

That et the corn for me!



XIX

Yellow Bread

I SUPPOSE there are any number of men and women today who, in all the span of their lives, have never eaten food that has not come out of cardboard boxes, paper bags, or tin cans from the grocer's shelves. So amazing—or so appalling, depending on the way you view it—has been the development of our ideas of food sanitation.

They will not understand this chapter. Indeed, it is scarcely to be expected that they could, since theirs is a cellophane consciousness.

Unless, on several occasions at least, you have gathered your provender in a basket or bag from the earth in which it grew, unless you have aided, or at least stood hands-in-pockets and watched the processes of shucking, paring, drying, salting, butchering or grinding by which raw victuals are rendered ready for the cook to practise her alchemy upon, you have eaten all your meals at least one remove from reality.

Under such circumstances, no one could expect you to know, blindfolded, whether the ear of sweet corn which you have buttered and salted and are about to bite into, is Stowell's *Evergreen* or *Country Gentleman*. How can you possibly be aware whether it was picked an hour before or, wantonly, that morning and before the sun had struck through the dewy husks? How can you tell, after the first mouthful, whether the corn bread is made of milled or water-ground meal? Or if the crisp, nut-sweet cracklings that enrich the pone come from a corn-and-mast-fed, or a skimmed-milk-and-swill-fed hog?

And yet these things are important. They figure as largely

in the equipment of the American epicure as an acquaintance with foreign cheeses and a temperature table for wines.

"That man a gentleman?" Colonel Tad Boylston exploded indignantly. "Why, dammit, he actually asked for a spoon and sugar and milk for his grits at breakfast! I don't believe the fellow ever sat down to a cold, baked ham and hot grits at eight in the morning in his entire life."

A large, ranch-grown, ranch-smoked ham—boiled, baked, sugared and delicately cloved—cold enough to fall away from the carving knife in slices as thin and pink as a rose petal, graced the breakfast table at the Porchers' ranch near El Paso when I stayed with them there many years ago. Since that October I have breakfasted on *churros* and *café con leche*, (usually goats' milk) in the lichened hill-towns of Estremadura. I have started a day on sour black bread, beer and the small savory sausages of Debrečín in Ruthenian inns. I have rejoiced in the desert sunrise and the sour-dough biscuits and salt pork at a Nevada prospector's camp. And on a few occasions I have languidly accepted iced grape fruit, Melba toast and coffee from a subservient waiter in some high-towered and proportionately high-priced Ritz-Biltmore. But no breakfast eaten anywhere rivals those at that ranch beside the lazy Rio Grande.

The core of the breakfast was the ham and the big Sheffield-plate dish of hot hominy grits. The last were not the thin watery pap which passes for hominy on so many menus. Before being served, the hominy, which had cooked slowly all night on the back of the range, had been salted, sugared slightly, enriched with butter and a generous cupful of cream. At the table you were encouraged to add to it still more of the home-churned butter. Sweet and smoking hot, it was the perfect accompaniment to the cool and tangy flavor of the baked ham.

Fruit, on that great ranch with its orchards and serried vineyards, was a matter of course. And of course there was coffee. But also, there were two tall, chased silver flagons filled with

fresh buttermilk. The flagons, the work of some seventeenth-century English silversmith, had come out to the Carolinas in the high-decked galley that brought the first of the Porchers. After the Civil War they made the journey with Madam Porcher and her husband in a covered wagon to the Texas country. That was when the Apaches were stealing cattle and scalping women. Madam had brought along, too, her own book of recipes, and her standards of how South Carolinians, even in exile, should live and breakfast.

Boiled hominy used to be sold in the streets of our eastern cities as *polenta*—which is no more than corn-meal mush—is sold in Italy. The hominy-makers' cry,

*Hominy-man is on his way
To sell his good hominy.*

was set to a chant which rose deliciously at the end of the second line. Dutch Molly's voice was hoarse from Swedish beer and sleeping out on foggy nights. But Clio, the young quadroon daughter of a runaway slave, who sold hot hominy in the streets of New York, captured the imagination and the musical ear of Stephen Foster. He tried to get her, and her song, down in verses and chords. "There's a wild, wooing tone in her voice that I cannot catch," he lamented. So Clio, the hominy-seller, joins the girls over the bonnet-shop who used to peek through the windows at young John Keats, and who eluded all his efforts to imprison them in a sonnet.

If you are one of the squeamish breakfasters who start the day on lemon juice, hot water and a raw carrot grated, then try hominy at lunch or dinner. Try hominy fritters made this way:

Beat the yolks of two eggs, and beat these into two cups of cold boiled hominy. Add half a cup of flour sifted with two teaspoons of baking powder and one teaspoon of salt. Add three quarters of a cup of milk. Fold in the stiffly beaten egg

whites. Drop this stiff batter by spoonfuls into deep boiling lard and fry a rich brown.

Made by this rule, the fritters can be served with a meat or egg dish. Or you can sweeten the batter and serve them for dessert with a wine or fruit sauce.

About the time the Hunters' Moon is riding the sky, the men I know go duck-shooting in the marsh, or down through Canopus Hollow after pheasants. They come home from these sorties late in the dusk; wet, weary in the joints and incredibly hungry. On such nights, by common consent, there is hominy pudding. This is made of boiled grits, milk, butter, salt, pepper and eggs; the yolks and whites beaten and added separately. The pudding is baked for an hour in a moderate oven. Sometimes we add grated cheese and paprika to it. But with grilled pork chops, hot, spiced apple sauce and a wooden bowl of mixed endive, escarolle and chicory salad—well, it makes up for those birds that got away.

Hominy muffins are good, too. But unless these are made by a skilled hand they are apt to sit on the stomach as heavily as an importunate creditor. And cold hominy mush, cut in squares, rolled in flour and fried a rich brown, served with maple syrup is good eating, whether there is fried chicken to go along with it or not.

You can fry corn-meal mush in the same way. And very good this is, too, with either maple or corn syrup. Or with thick, dark, New Orleans molasses.

Perhaps you have to have your roots in American soil for two generations at least to savor this sort of eating. The French women who came out to Louisiana in the days of the Bubble complained bitterly at having to eat corn meal. A letter from the Governor to Paris says,

The men in the colony begin through habit to use corn as an article of food; but the women, who are mostly Parisians, have for this food a dogged aversion, which has not been subdued. They

inveigh bitterly against His Grace, the Bishop of Quebec who, they say, has enticed them away from home under pretext of sending them to enjoy the milk and honey of the land of promise.

Men have always liked corn and the dishes made from it. In the dining rooms of their university clubs the hot corn sticks and muffins are always first choice. Women restaurateurs, like Ella Barbour, Jane Davies, Miss Kirby and Miss Allen—to mention only a few of those who are doing a thriving business feeding New Yorkers—and Mary Love, whose tea room in Columbus, Ohio, draws nearly as many of the politicians as the Capitol, never fail to have hot corn bread of some sort for their men customers. It's the men who make a restaurant pay.

The secret of good corn-meal mush—and, believe me, it can be very good—lies in having water-ground meal to start with. Don't let the grocer's clerk persuade you that the kind he sells done up in cartons and put out by some breakfast-food manufacturer is just as good. It isn't. Probably the clerk is an Irishman, and no Irishman has the proper feeling for corn meal. They import it into Eire, but they feed it to the pigs and the fowls and feed themselves on soda-bread. The fact that Irish bacon and Irish eggs fetch high prices in the world's markets, and Irish labor a poor price, apparently has not taught the peoples of the twenty-six counties anything about nutrition.

Water-ground meal is, as the name implies, corn meal which has been ground by stones turned by water power. It matters not at all whether the agency for gathering the power is a wheel in the brook or turbines. Either way, water power is slow and rhythmic. The slow turning of the tedder does not overheat the meal; the millers' refining processes do. And overheated meal has lost its flavor. It loses something else by the refining process; this is the germ which contains the fat and most of the mineral values as well as a good part of the sweet taste. The refiners extract the germ from which they make

gluten feeds for cattle and the even more valuable corn oil. What is left, after the indigestible hulls have been bolted out of the meal, they do up in packages with pretty pictures on them and sell to the public for Indian meal. On their books this is just a by-product of the lucrative gluten and corn-oil business.

But when you eat suppawn or bread made from water-ground meal, you are getting all that the corn has to give in the way of food and mineral and fat values. The only thing that has been taken from the natural grain is the chaff of the hulls.

It is true that water-ground meal does not keep as well as meal from which the germ has been removed. This is one reason why many of the grocers do not stock it. In pioneer days the housewife sent a sack of corn to the mill and used it up before sending another seventy pounds or so to be ground. Even so, when the sack was getting low, careful housekeepers usually poured the meal into big sheet-iron pans, and set these in the warm oven. Presently, any corn worms which had developed, or were on the point of hatching, would wriggle to the surface of the pan and over the sides to quick death on the bottom of the oven. The meal would be turned over and over with a long-handled spoon until it showed no more inclination to squirm. Then it was made into mush or yellow bread. And next day one of the boys rode another sack of corn over to the mill.

Good suppawn needs long, slow cooking. Preferably in an iron pot in which there is no chance of scorching. If you are condemned to a modern kitchen of the operating-theater model, all porcelain tiles and chromium, and fitted with Bunsen burners and electric gadgets, at least use a heavy aluminum double boiler to cook mush. And forget the gas bill.

The hasty pudding of old-fashioned New England was nothing more than suppawn, sweetened with molasses and spices, and occasionally with Spanish raisins. Milk improved it; cream glorified it. The young gentlemen of Harvard College were

devotees of hasty pudding. Shortly after the Revolution, and when New England was losing a large proportion of her manpower to the Ohio and Illinois country, Harvard undergraduates started a new club called "Hasty Pudding." At first, the activities centered around dinner at a certain Cambridge inn on "hasty pudding night." Later the club went in for the dramatic arts; truly, an evidence of our corn-fed culture.

Nowadays, I believe, the dining-room stewards at Harvard feature an Indian pudding. This is how they make it: Over three tablespoons of corn meal they pour three and one-half cups of scalding milk. This is stirred well and sweetened with one-third of a cup of molasses, and cooked until it thickens. Constant stirring is necessary to keep it smooth and to prevent burning. "Remove from the fire," the directions continue; "add one cup of cold milk, half a cup of sugar, two tablespoons of butter and one-half teaspoon each of salt, powdered cinnamon and powdered ginger. Pour the pudding into a buttered, earthen-ware dish, and bake in a moderate oven at least three hours."

I have been told that this is the Harvard undergraduates' favorite dessert. And, lest our oldest seat of learning be accused of an unseemly democracy, there is still a nice social distinction between those who pour milk over their Indian pudding and those who can go to cream. There's a rumor that the young nabobs on the Gold Coast top theirs off with vanilla ice cream!

Our first American poet sang the praises of early days in New England when

. . . *the dainty Indian maize*

Was et with clam-shelles out of wooden trays.

Doubtless he was referring to suppawn. But in the days when corn was pounded in stone mortars and bolted through a basket sieve, the corn porridge was a coarse and gritty substance. The Indian method of preparing maize was to steep it in hot water for half a day, then to pound the moist grain

into meal. This was sifted, and the large grains which did not go through the pores of the sieve went back into the mortar for another pounding. From this meal the Indian woman made her *nookik* and *appones*. Sometimes wild berries were mixed with the dough before baking. Peter Kalm wrote enthusiastically of the flavor of this Indian berry-bread.

Boiled with water, the meal became *suppawn*. If the squaw happened to have some salt, she seasoned the *suppawn* with it. Lacking salt, she made do with hickory ash.

To me, corn meal mush means very hot days in summer, sweet with the smell of sun-baked grass, and noisy with locusts. While Geordie took the tired horse around to the stable and harnessed another for the afternoon round of calls, my father would sit down at the mahogany table with me beside him. At his place would be a tray with a deep dish of cold corn meal mush and a tall, brown Bennington-ware jug filled with fresh buttermilk. My father always ate his mush and buttermilk from a blue bowl which had a picture of Kenilworth Castle on the bottom. When the last spoonful had disappeared, there under a thin milk film would be the turrets old in story.

"Look," my father would say, "right there, under that crumb of corn, is where Robert Dudley stood and said how-d'ye-do to Queen Elizabeth. And this not an hour after he had . . . What do you think?"

"I don't know," I would say. Knowing well enough, but finding it too awful to put into words, and too delicious to miss hearing him tell it to me all over again.

So the romance and the tragedy of fair Amy Robsart were brought to me in a bowl of *suppawn*.

Corn batter-cakes are a breakfast standby in many parts of the South. To make these, you start with two cups of cooked corn meal mush. Add to this three-quarters of a cup of white flour, two eggs well beaten, one teaspoon of salt and sufficient cold milk to form a thin batter. Pour this from a pitcher onto a greased, hot griddle, and bake brown on both sides. Try

them, some day, with rich chicken gravy. And pork—"white meat" gravy—well made and served with hot batter-cakes, grits or pones is not to be sniffed at.

Corn, grits and salt pork are the food of the Piedmont area where pellagra ravages so many lives. But neither corn nor pork causes pellagra. The disease is brought about not by what the poor southern whites eat, but by what they don't eat. It is their sins of omission which have laid them low.

When the story of the pellagra sufferers in this country broke over the world at large, there was a great hue and cry against corn. The accusation of causing pellagra was brought against our national cereal. All over the country people, who all their lives had eaten corn, suddenly became afraid of it. Being good business men, the wheat flour millers and the manufacturers of wheat foods did not miss this opportunity to push their products.

The people who raised the loudest outcry apparently overlooked the fact that during the two centuries in which Americans were conquering the wilderness, fighting the Indians, French and English, building towns, roads, universities, cities and a Great Tradition, the cereal which figured largest in their diet was corn. The men who signed the Declaration of Independence ate corn. I never heard that one of them had pellagra. The Powhatan knew no cereal but maize. He lived to be over eighty; and though enormously fat, was also possessed of a physical vigor which filled the young English settlers with profound respect.

The early American corn-eaters ate, with the corn, wild game, wild fruits, in which this country abounded, and vegetables of many sorts. They drank milk, and quantities of home-brewed beer. John Cotton said that milk and ministers were the only things cheap in New England. Cider cost only a few shillings a barrel. John Adams advocated temperance reform; but to the end of his life—on the same July fourth on which Jefferson died—he drank a large tankard of hard cider every morning when he first got out of bed.

Too, these stalwart forefathers of ours lived before civilization had advanced to the point of setting a drug store on every corner to sell bicarbonate of soda to Americans whose diet of refined cereals is already low in vitamins B and G.

What the Piedmont peoples need is not less corn but more milk. Less saleratus, and more foods rich in these vitamins which sodium bicarbonate destroys. Cows and truck gardens would do a lot to lift the health rate. So would two dozen tomato plants in every yard. One eminent dietician has figured that "three cents' worth of milk or yeast in the daily diet would wipe pellagra from the face of the earth."

So don't blame corn.

In the deep South they call it "yaller bread." And this may mean a raised loaf in which corn meal is mixed with rye and wholewheat flours, pones, dodgers, thick corn bread with a buttery brown crust, or the kind that is poured thin on a griddle or a dripping pan in the oven and baked in a crisp, crunchy sheet. Whichever way you make it, it has its points.

Nothing so distinguishes the Northern from the Southern woman as the way each approaches woman's most pressing problem. The Northern girl sets out to get her man by competing with him, or with some other girl where he can have an unobstructed view of her success. The Southern girl wastes no time on competition. She plays charm. Nor is her charm limited to a flower in the hair, languishing smiles and marsh-mallow coquetry. While diverting her quarry's attention with these, she brings up an overpowering flank attack. She feeds him. Not as science and the Northern girl—who has been to a college where they believed in vitamins—say he should be nourished. But as every male, deep down in his secret, greedy, infantile soul has longed to be fed.

Of the ten million or so American women who extraverted their appetites for romance by following the Windsor love affair, probably only those born south of the Mason-Dixon line gave full credit to the stories of southern dishes which the

erstwhile Mrs. Simpson used to serve to her royal admirer. In New York they laid it all to clothes by Molyneux and cosmopolitan sophistication. Down South they shrewdly suspected yellow bread.

There are as many recipes for the making of corn breads as there are F.F.V.'s in the Tidewater. Every family has one; and every family's is "the best." Some call for buttermilk; others advance the claims of clabber. Some ask for a little wheat flour; others protest that this spoils the flavor of the corn. In fact, they argue about making corn bread the way New Englanders argue about crullers and doughnuts.

As in all debates of this sort, there is only one right way. And that is

MY WAY TO MAKE CORN BREAD

To two cups of corn meal add one teaspoon of salt, and one teaspoon of soda. Add two cups of sour milk and stir well. Then add two eggs, well beaten. And one-fourth of a cup of butter, melted. Bake this in a well-greased and warmed sheet-iron pan in a fairly hot oven for half an hour.

You need buttermilk for pones. Some prefer clabber. But whether you use one or the other, whether you roll the dough in moistened corn husks and bake these in the embers, or drop it onto a skillet, or bake the pones in the oven, you should eat them hot with plenty of sweet butter. And for a drink, buttermilk.

Soon after I had begun the writing of this book I was traveling by train from Washington toward Pittsburgh. My seat-mate was a young man with a friendly smile and a pleasant Tennessee drawl. Somewhere between Harpers Ferry and Cumberland, and midway between Munich and *Gone With the Wind*, I made the discovery that though by vocation he was a government clerk, by avocation he was a cook. Like all the men I have known who have this gift, he spoke endearingly of the materials and mechanics of his art.

"Well, ma'am, to make right good pones, it's like this.

You get you some co'n meal. White's the best. A bitty salt. And 'bout a dime's worth of soda. Not what you kin buy with a dime; what you kin put onto one of 'em. Mix that up good with some nice fresh-churned buttermilk till you got a batter. Take and drop that outen a spoon onto your hot spider, and clap the cover down onto it. Leave 'em to bake maybe half an hour, till they're sweet and brown. You jest cain't help likin' them pones, ma'am."

Pones made that way, with cracklings mixed through the batter before baking, are as good food as any epicure could sigh for. They are best after a day out of doors fishing or shooting. And for a lunch under a sweet-smelling locust tree in haying-time, you can't beat them, either.

Hoecake, I have read, gets its name from the Indian *nookik*. It is merely corn meal, salted and mixed with scalding water or milk. The batter should be left to stand for at least an hour before spreading it thinly on a pan, or on the greased blade of the field hoe, and baking it over the open fire.

When Abraham Lincoln recalled his childhood, he remembered that the Sundays of those years in Kentucky and Indiana were marked by wheat cakes. On all other days the Lincolns ate corn-dodgers.

One point in favor of the dodger is that it can be baked, or steamed in a pot like a dumpling. It all depends on what else you have to eat. Dodgers are made of one cup of meal, salted; two tablespoons of melted shortening, and sufficient cold water to form a dough which can be rolled between the palms into sticks four inches long and the thickness of a hoe handle. Bake these in the oven or on a greased skillet. Or drop them on top of a pot full of boiling pokeberry shoots or turnip greens, flavored with a ham knuckle or pig's jowl. Let them steam twenty minutes or so, and then eat them with the pot-likker.

In parts of New England, they make corn dumplings like this and drop them on top of a pan of stewing sweetened

fruit: apples, blueberries, cranberries or beach plums. One of these fruit stews served with corn dumplings and rich cream is called a "grunt." The name is no mystery.

Pones, dodgers and hoecake are cabin foods. But every quality child born in the South has stolen away from the Big House to eat these in the servants' cabins, and to wonder why he didn't have them on his mother's table.

Spoon bread is a quality dish, however. Really, this is not a bread, but a soufflé of eggs, butter, milk and corn meal. Let those who turn up their eyes in ecstasy at mention of a cheese soufflé as this is served at the Tour d'Argent, try Miss Mary Maconochie's Southern spoon bread. It is made from a rule she brought from one of those big, square quiet houses that border Court House Square in Frederick, Maryland. She made it for me, and we ate it in the walled garden behind a house on East Sixtieth Street in New York on an evening when the full moon rose over Queensboro Bridge and when the radio blared the news of Germany's march on Poland. But the spoon bread triumphed over the heat and the city and the international situation. It is one of the few things in the world that can do that.

This is how Miss Maconochie makes it: First she pours a quart of milk into a double boiler and brings this to a boil. In this she melts an "egg" of butter. Then she pours the boiling milk slowly over two cups of white water-ground corn meal to which has been added one teaspoon of salt.

After this it is time to take the bowl and sit down by the kitchen window and stir, and stir and stir. Fifteen minutes of stirring isn't too much, according to Maryland standards.

The yolks of two eggs, well beaten, are then put into the batter, and lastly, the stiffly beaten whites. The batter is poured into a buttered and warmed earthenware dish and clapped instantly into a hot oven, to bake "a good thirty minutes."

Like all soufflés, spoon bread must be eaten the minute it

comes from the oven. So invite only guests who have a record for promptness.

All the best corn dishes do not come from the South. Up in Rhode Island, the women of Wickford, and "round Newport way," have a knack with Indian meal. Over in Peacedale they make a raised bread similar to the bakers' Penny Household Loaves of early days. This calls for equal parts of corn, rye and wheat. It is leavened with yeast, sweetened with molasses, and baked in loaves which come out of the oven dark, crusty and fragrant.

Boston brown bread has equal parts of corn, rye and graham flours. But this is steamed, and not kneaded and baked.

As a matter of fact, corn meal does not knead easily or well. Therefore it is more usual to make it into a cake, not a loaf. But during the war which made Scarlett O'Hara, women in the Southern states learned to do things with corn meal which they never did in times when there was wheat flour for raised loaves. Down in Maryland they made a yellow bread which was so good that some of them have gone on making it ever since Barbara Frietchie hung out her flag.

It is made by stirring four cups of corn meal into an equal quantity of boiling water. As this thickens, add one tablespoon of salt, and then set the mush aside to cool. To this should be added one cup of luke-warm water in which a yeast cake has been dissolved, and three cups of white flour. Knead, and allow to rise overnight in a covered bowl set in a warm corner of the kitchen. For breakfast, cut off some of the dough, pat into biscuits and bake. The rest makes a loaf.

Compressed yeast is one of today's luxuries. Our great-grandmothers used to send our grandmothers to the baker's for five cents worth of "risings," or else they made their own by mixing corn meal with some sour milk and letting this ferment overnight. This is true sour-dough.

Without this for a "starter," my great-grandmother Halsey believed no one could make proper buckwheat cakes. She had learned her griddle-cake lore from her grandmother, who sent her husband off to fight the British at Monmouth with a stack of fresh buckwheats buttoned inside his homespun "bounty coat."

The first English settlers in New Jersey learned about buckwheat from the Swedes who were settled in the Delaware valley. Soon the dark, slightly sour griddle cakes made of this flour were to the middle colonies what ponies and yellow bread were to the South, and johnnycake to Roger Williams' settlers.

"I can't remember but one morning in my whole life," Great Great-uncle Sam would announce whenever there were new faces at the breakfast table, and choosing the moment when the colored "girl," who bore the name of Missouri Frances Josephine Hazeltine Booker, appeared from the kitchen with the first stack of smoking cakes, "when I didn't hanker for buckwheat cakes. . . ."

"Sam," great-grandmother would set the big silver coffee-pot down on its tile with finality. "You're not going to tell that story all over again."

Her brother would cock an eye at her.

"Why, Julia Ann, what's the matter with that story? It's true, every word of it. Besides, I don't believe Miss . . ."—with an inquiring look at the visitor. "Now, that was a real interesting thing that happened to me. You'd like to hear about it, wouldn't you?"

Outmaneuvered at her own table, Julia Ann would sigh and take up the coffee-pot again. Uncle Sam went on, happily.

"When I was a young feller my brother Schuyler and I used to go up to Sullivan County every so often to buy horses. They raised good ones up that way. Of course there weren't any steam cars in those days. We drove. Three days it took from where we lived outside of Morristown. Nights, we put up at farmhouses. There was one house I always liked going to. Nice,

friendly folks; and the woman was a good cook. She made about the best buckwheat cakes I ever ate anywhere."

While reflecting on the goodness of those distant cakes Uncle Sam absentmindedly slid the entire stack from the plate Missouri Frances offered onto his own plate. With his knife he deftly separated the cakes, slid butter in between, patted the pile tenderly to squeeze the lumps of butter until it ran out at the sides, and looked about for the syrup jug.

"Yes, I always looked forward to getting to that house and the breakfast she would give us. Especially when it was winter-time. Well, one morning—frosty it was, I remember—I hustled into my clothes to get down to the kitchen where 'twould be nice and warm, with breakfast getting ready and smelling good, and all that.

"Just as I pulled open the door there was the woman standing by the cookstove, and there was the big jug of batter where it always stood to one side of the hearth. And what did she do but lean down and yank a big black cat out of the jug. 'There, drat ye,' she said." Dramatically, Uncle Sam went through the hand motions of one holding up an animal by the scruff of the neck and milking the other hand down its back and tail.

"That's the *third* time you've been in that batter.'

"Funny." Uncle Sam smiled benignly at the guest's expression of horror. "You know, I just didn't seem to relish any buckwheats that morning. First and only morning in my life. though, that I didn't."

True johnnycakes, as they make them in Rhode Island, are baked, like buckwheats, on a soapstone griddle. This lets them cook more slowly than they can on a spider. And they should cook for some time because the milk with which the batter is made may be warm, but must not be scalding.

To one cup of white, water-ground corn meal—real Rhode Islanders won't use any other kind, and usually they insist that this shall come from a certain mill in their city of Ports-

mouth—add one-half teaspoon of salt. Thin to a batter with cold or luke-warm milk. The batter should be so thin that it drops from the blade of a knife like heavy gruel. Bake the cakes on a soapstone griddle, turning to brown both sides.

When Roger Williams' settlers had to go on business to Providence, Boston or New London, they carried a dozen or so of these "journey" and hence "johnny" cakes to sustain them on the road.

The further one delves into our native American culinary lore, the more uses for corn does one discover. Apparently the grain challenged the imaginations of every foreign group which came to these shores, and each group answered the challenge in its own way. Hence the corn fritters, chowders, puddings, pies and even pickles—besides an endless variety of breads.

Mark Twain, surrounded by the minestrone, veal au marsala, boiled chestnuts, Bel Paese and Parmesan cheeses of Italy, took out a pencil and made a list of American dishes he was going to demand the first minute he set foot on American soil. Five of them were made of corn: pone, hominy, hoecake, green corn on the cob, and green corn out from the cob and dressed with butter and pepper. Doubtless the only reason the list did not run on to succotash, Indian pudding, batter cakes and chicken and corn pie was that homesickness overcame him.



XX

Sweet Corn Ripe

AS YOU read the title of this chapter it is likely that you will think of these words as you have seen them many times, printed crookedly on a shingle, and nailed to a fence or a tree by a roadside farm.

Every year, along about the first of August, about one million such signs go up on all the roads in at least forty out of our forty-eight states. Simultaneously, some thirty million American mouths begin to water. There is no doubt about sweet corn being America's favorite vegetable. The dieticians have worked hard to make us value the vitamins in the tomato and the chemical properties of the carrot. They sold us acres of spinach on the iron it was supposed to contain. But no Dr. Hauser was needed to sell America sweet corn. Even those American men who during ten months of the year will acknowledge no vegetable but the potato look forward to August and September and devote those months to the solid enjoyment of corn on the cob.

What the sweet-corn season does to the sale of butter I have no way of knowing. But medical men who are interested in the production and reduction of human avoirdupois know very well that no one in this country loses weight during the months of Golden Bantam. There isn't sufficient will-power or vanity in the American temperament to enable even an overweight motion-picture star with a contract hanging in the balance to say "No" to temptation when it is presented in the form of two or three of those short, golden, eight-rowed ears, with plenty of butter to spread along the rows as one gnaws. Or to leave it at two or three, either.

Unconsciously one says "Golden Bantam" when sweet corn is mentioned. This goes to prove how a new variety of a widely popular vegetable can capture a whole nation of connoisseurs. For Americans were up on corn long before W. Atlee Burpee offered the first "Golden Bantam" on the market. That was in 1902. Then, and for some years to come, Americans thought of yellow corn as "chicken feed." Sweet corn, they thought, should be pearly white. Yellow corn was tough. True, the yellow corn they had known was tough. It was field corn which has a large starch content in the kernels. Sweet corn differs from the dents and flints in its low content of starch and its high sugar content. But the color of the kernels has nothing to do with the proportions of what is inside them.

The variety "Black Mexican," which has some black kernels scattered through the rows, was known long before the creation of Golden Bantam. But Black Mexican was regarded as a novelty, not as a leader. The popular sweet corns were "Stowell's Evergreen;" "Country Gentleman" with its small, translucent kernels which wander crookedly along the cob like a countryman finding his way home from a bibulous market day; "Metropolitan," an early variety; and "Peep o' Day." The canners called for "Evergreen" and "Country Gentleman." They too said that people wouldn't eat a yellow corn. They had something to find out.

During the Civil War years a boy was born in a red brick farmhouse not many miles northwest of Boston. His name was Luther Burbank. Many years later a distinguished Dutch botanist was to say of him that he was "a gardener touched with genius." Luther Burbank was slow to admit to the genius part of the characterization; but he never was in any doubt about the truth of the first half. From the first April when he toddled after his mother as she went about her flower garden, his career was determined.

Before 1875, young Burbank on his farm near Fitchburg, Massachusetts, was experimenting with growing sweet corn

that would be ready for market ten days or one week before the other farmers had roasting ears to sell. Before-season vegetables were worth money. Luther Burbank worked out a scheme of starting his sweet corn in flats filled with fresh stable manure and leaf mold. When the seeds had germinated, and the roots were three or four inches long and the green shoots about one inch, he dropped them into the drills in the garden, and covered them over with half an inch of earth. Other farmers said you couldn't grow corn that way. But young Burbank's corn grew. Moreover, he did not have to pay particular attention to which way the germinated seed fell into the drill. The corn could take care of itself. Those seeds just wriggled around under ground, got their roots under them and their shoots on top and started to grow. Many of them were up and out of the ground within twenty-four hours of the planting. Luther Burbank was able to snap off hundreds of ears, load them on a spring wagon and drive them to the market in Fitchburg two weeks before his neighbors had corn to sell. In this way he could get fifty cents per dozen for the ears. Two weeks later sweet corn would sell at twenty-five cents per dozen ears.

It was in his effort to develop a variety of sweet corn which would stand earlier planting than most of the sweet corns could and which would mature quickly that started Luther Burbank thinking about a yellow variety. He made several experiments, but these were interrupted by his moving to California in 1875.

Meanwhile, back in Greenfield, Massachusetts, a man named William Chambers was thinking along the same lines. Chambers was one of those amateur gardeners who are always trying experiments. "Green messing" his women folks called his puttering around the garden. They were impatient of his experiments, such as grafting a peach cion onto an apple to see what Nature would make of such a marriage. "Trying to improve on what God, in the first chapter of Genesis, said was already perfect."

One of the things Chambers tried to improve was sweet corn. He had good land on which to make his trials. It was historic corn land. The Mohawks had planted corn in those fields running down to the Connecticut River before the Massachusetts colonists established their frontier forts along the valley. The settlers in Deerfield and Greenfield and Wisdom had raised corn and sent it and furs to Boston in trade for salt fish. They made a rhyme about it:

*Conway for beauty, Deerfield for pride,
If it hadn't been for codfish, Wisdom would have died.*

Bill Chambers liked to think about those earlier corn planters as he puttered about his own garden. For years he selected special ears for seeds, he cut off tassels of some plants in order that only specially selected stamens should pollinize the crop. He bagged certain ears and pollinized them himself, by hand, then covered them carefully again in order to be absolutely sure of the lineage of the corn those ears would produce. What he got out of all these clumsy experiments was a breed of sweet corn that was quick to mature, yellow in color and even sweeter than the leading varieties of sweet corn.

The neighbors to whom he gave some of the ears to taste came back and asked for seed. Bill Chambers shook his head. He steadfastly refused to give away or sell a single seed.

When he died, Bill Chambers did not have much to leave, at least not as the world reckoned values. But up in the attic of his house there was a paper bag labeled "My corn seed." There are few gold mines that have yielded the fortune that was in that paper sack.

The executor of Chambers' estate took the corn and planted it in his garden. When the ears were ripe he invited a seedsman he knew to come to dinner. The main dish was a yellow sweet corn. The seedsman laughed a little when he saw it. But after the first mouthful he put down the cob and looked hard at his host. "Where did you get it?" and "Do you know what you've got?" and "How much will you take for it?"

were the questions he demanded. It was that seedsman who took the corn to W. Atlee Burpee, the Philadelphia seedsman who was always interested in creating and in launching new varieties of plants. Burpee bought two quarts of Chambers' yellow corn and the right to give it to the world, under the name he chose—Golden Bantam.

I hope the citizens of Greenfield, Massachusetts, will some day put up a statue to Bill Chambers, who created Golden Bantam, just as I hope some seedsman some day will name a variety of sweet corn for Captain Richard Bagnall who carried the seeds of the first variety from the Indian village in western New York to Plymouth and grew it in his garden there. Men who do things like that should be remembered. Even aside from the financial value of their contributions—and Golden Bantam has made millions of dollars for growers, and is in a way to make many millions more—there is the contribution to the nation's good eating. Food needs to be much more than all the dietitians give it credit for. If all that man needed to keep him in a state of physical well being were so many calories of such and such proteins, carbohydrates and fats, he could take three pills three times a day and put all the chefs and restaurateurs out of business. But the point is, he does need something more than just a chemical least common multiple. He needs the sensory enjoyment of good food well prepared. A great deal of the art of life is developed at dinner tables. And more than half of the famous epigrams of the world have come to birth in that stimulating atmosphere that follows naturally the placing on the table of a dish that is as appetizing as it looks. A man needs to enjoy what he eats for it to nourish him. His senses must be satisfied, or else they will develop a revenging neurosis. Frequently when I am talked to by food cranks who want me to grind up my salad and *drink* it, and who boast that they start the day with lemon juice, grated raw carrot, and an egg yolk in olive oil, I am reminded of the old conundrum, "Which came first; the hen or the egg?" Which came first with these food reformers, I

wonder; their eating habits or their dietary troubles? For all of them have the latter. And none of them looks to be particularly well fed. Too, there's more than a hint of neuroticism in their advocacy of minced-up, raw foods.

But then, I take my stand with those who frankly enjoy eating good food, and who are up to enjoying sweet corn for breakfast several times a week during its season.

Not sweet corn which has been picked the day, or several days before. Corn which has been off the parent stem more than an hour or two has lost its caste as a breakfast treat. What I write now is addressed to those who are lucky enough to have their own vegetable gardens, or who, at least, aspire to be in that fortunate position some day.

The recipe for cooking sweet corn on the cob starts like the old rule for making hare soup: "First catch your hare. . . ." First draw some fresh cold water into a large pot and put it on to boil. Then go forth into your own garden and choose some ripened ears of corn. The silk at the ends of the ears will be dry and brown and break off easily in your hand. But the husks will be green and moist. Bring in the ears and when the water is boiling rapidly, pull off the husks and filaments of silk and drop the ears into the pot. Cover and boil, unsalted, for three minutes.

It is not epicurean fanaticism which insists that sweet corn begins to lose its flavor immediately after it has been picked. There is a scientific reason back of the statement. The tenderness of the corn is due to the low quantity of starch in the kernels. The flavor is due to the large amount of sugar. While the ears are on the stalk, the enzymatic activity is constantly converting the sugar in the kernels to starch; but also, at the same time, new sugar is constantly coming into the ears from the leaves. When you pull the ear, you do not stop the enzymatic transformation of sugar into starch. But you do cut off the compensating supply of new sugar. The longer the corn stands, after pulling, the tougher, the starchier, and the less flavorful must it become.

Sweet corn is a product of New England. And the best sweet corn is still grown in those six states. Maine and New Hampshire lead off. But Rhode Island corn is famous too, though being a small state she cannot compete with the others in quantity production. At Westport Point, which is one tip of Rhode Island shore looking toward Point Judith, there was a sea captain's widow named Mrs. Manchester who took summer boarders.

Once a week Mrs. Manchester gave her boarders a boiled dinner—boiled lobsters, boiled bluefish, boiled new potatoes, and boiled corn; followed by a boiled pudding of white, water-ground corn meal and blueberries, with more stewed blueberries poured over the helpings.

After doing justice to this meal the boarders tottered down to the wharf and spent the afternoon in discussion whether it was the lobsters which gave value to the corn and the potatoes, or the other way round. I believe that Mrs. Manchester, who had cooked and served the dinner, frequently spent the rest of the day husking and scraping a bushel or two of sweet corn preparatory to drying it for winter use. All the gumption had not been diluted out of the New England blood in her day.

You have to go to New England, too, for good succotash. And succotash, when it is good, can be very good, indeed. It is not, as some people seem to think, an economical way of using the left-over ears of boiled corn. Succotash should be made of fresh corn, scored from the cobs and put into a pot with some small pieces of salt pork and a very little rich milk. When this is bubbling, add an equal quantity of young lima beans and some salt and pepper. When the beans are tender the succotash is ready for a generous lump of butter and to be served. This method of preparing succotash is to be advised before the original, Indian recipe which was to boil the corn and beans together in a pot with a plump young puppy and a handful of hickory ash for seasoning.

If New England is the natural habitat of the succotash,

you have to go south, at least as far south as Maryland, to find good corn fritters. Southern cooks are unsparing with butter and eggs, something no Yankee cook can ever quite bring herself to be. At Sunday night suppers on the Eastern Shore they serve something called corn oysters. This is how they are made:

CORN OYSTERS

Take one dozen ears of sweet corn and cut through the kernels lengthwise with a sharp knife. Then cut the corn from the cobs. To one pint of this corn add one cup of sifted flour, half a cup of butter, three eggs well beaten and two teaspoons of salt and two of black pepper. Drop this batter into very hot deep fat and fry crisp and brown.

No true American feels that there is anything amiss in eating green corn from the cob. Rather, he feels that there is a fine, democratic principle involved in always eating his sweet corn that way. There's something pretty finicky about the silver corncob holders that sometimes appear among a bride's wedding presents, but not, I fancy, on her table. Any American worthy to eat our national vegetable should be strong-handed to the point of being able to hold a hot corncob in his own fingers. Cutting the corn from the cob onto one's plate is a method that belongs to the two childhoods. Anyone who feels that corn on the cob is not a dinner-party dish should serve corn pudding.

CORN PUDDING

Score and cut the corn from the cobs as described in the recipe for making corn oysters. To one quart of cut corn add one tablespoon of sugar, one of butter, and salt and pepper to taste. Beat up two eggs with three-quarters of a cup of rich milk and beat this into the corn mixture. Pour into a buttered deep dish and bake fifteen minutes in a hot oven.

Of course one can use canned corn to make these dishes when fresh corn is out of season. But it is not so good. The

long cooking and extremely high temperatures required in the canning process destroy some of the corn flavor and toughen the kernels. Just the same, among the canned vegetables, tomatoes lead in popularity, with peas and corn running neck and neck for second place. The varieties most in use for canning are Evergreen and Country Gentleman, though there is a steadily growing demand for canned Golden Bantam. Farmers "down East" are raising the yellow sweet corns for the canneries and making good profits at it.

There seems to be a nice justice in Nature. New England lost her sons to the corn belt. New England propagated the first sweet corn, and New England produced the most popular variety of sweet corn ever marketed. In recent years New England farmers have received higher prices for their sweet corn than the corn belt farmers got for theirs. True, it cost them more to raise the crop. They had to manure the fields heavily. But the manure and the labor won them a profit on land that would otherwise be profitless. Maine, with fewer than fifteen thousand acres of sweet corn under cultivation in 1935, harvested fifty thousand tons, in the ear. This was as many as New York farmers raised on twenty-one thousand acres, and almost as many as Ohio got from a twenty-six-thousand acreage. Too, that Maine-grown sweet corn was worth \$16.50 per ton. This price was \$6 more than sweet corn brought in New York, and twice what the Ohio farmers got for theirs.

America's annual sweet-corn crop which goes to the canneries and commercial markets runs to over eight hundred thousand tons. How much more is eaten where it is raised there is no way of knowing. With such a market for the vegetable it is no wonder that the scientists who experimented with hybridizing field corns should have turned their attention to the creation of hybrid sweet corns too.

The best hybrid sweet corns are the result of a single cross. That is, they are made from two inbred lines of the same variety. That is the story behind the hybrid "Golden Cross" which has been bred from crossing two inbred strains of

Golden Bantam. This method of hybridizing seems to strengthen the good points in the strain and to produce seed which resists drought and excessive hot weather better than the original variety did.

The tender sweet corn cannot be planted in the spring as early as one plants the field corns. Once planted, it must suffer no setbacks of cold and damp. But the crop matures many weeks before the field corns can be harvested. The ears are ready for pulling eighteen days after the silk appears at the ends of the immature ears. For canning purposes the growers let the corn wait another two or three days before taking it to the factories.

Even in the corn belt, where the prices for sweet corn are less than they are in New England, an acre of sweet corn will bring the farmer about the same amount in dollars as that acre planted in field corn would yield. But the sweet-corn crop is ready money, whereas he may have to wait months before he can get a good price for his field corn. Too, sweet corn does not exhaust the fertility of the soil as the other corns do. There seems to have been a scientific reason behind the Mexicans' feeling that after the ears had been formed the corn needed refreshment and more food to bring the grain to perfection. We know that it is in this period that the corn makes its greatest demands upon the chemical properties in the soil. Sweet corn, which is harvested before the kernels complete their development as seed, is therefore less demanding of the earth.

In the World War, there was an American flyer whose plane was brought down in flames and who escaped with his life but not without terrible facial injuries. He was in a base hospital for many months after the Armistice was signed. His physician and nurses knew that his slow recovery was due to the fact that he felt that a man as injured as he was had nothing to live for. In France, among thousands of wounded and disfigured men, he might pass almost unnoticed. But not in Kansas.

Finally, a relative of his managed to get transportation to Europe and came to the hospital. All that he could say about the eagerness of those at home to welcome the young man back apparently did not rouse the injured man from his apathy. But the wife of the relative had an idea. She sent a cable to America and asked for one dozen ears of sweet corn. They were sent over on the fastest ship in the refrigerating room. When they were delivered at her hotel, the American woman asked the manager to let her use the kitchen for half an hour. There, with the French cooks watching curiously, she boiled the corn. A taxi was waiting to take her and the covered dish straight to the hospital.

She fed that corn, buttered, salted and peppered, to the man lying in the bed. After the third mouthful his face began to work like a child's, getting ready to cry.

"I didn't know till now that what's the matter with me is that I'm just damn homesick."

That man is a corn farmer now, somewhere in Missouri. The ravages war makes are still on his face. But there is something else there, too. That is contentment. Very often, I think—for he is a thoughtful sort of person—as he looks over his acres of standing corn, he remembers those twelve ears of sweet corn which literally saved his life by making him want to see again and feel under his feet that land that could grow them.



XXI

Enemies in the Field

THOSE who live on the land develop a terrible patience. You can see it in their hands. Even when they are dead, like Sandburg's "Illinois Farmer," their hands continue to remember the tools they have held, and the acres they have plowed.

Too, time in industry and time on the farm lie in different dimensions. The factory worker's success or failure is recorded every seven days in his pay envelope. The manufacturer reads the market reports and the world news each morning and speeds up or slows down production to keep pace with times good or bad. When demands for goods pour in he has only to turn to the employment agencies for hands to fill the orders. When business slumps, he can turn men off; or he can use his lathe and manpower in the manufacture of some other commodity with which the market is not glutted. Part of his capital is his ability to change.

The business man, too, operates on a flexible system which, ideally, permits him to vary his policy from month to month. Thus he cautiously feels out each new step as he advances. He can retreat from loss as agilely as a timid bather from chilling water.

But the farmer cannot speed up eighty acres of corn to catch an upswing in the market. He cannot put on an extra shift to bring harvest one day nearer. He cannot plow up his corn and plant sugar beets on news of a revolution in Cuba. Since he must operate on a three- or four-crop rotation system, he cannot balance his books at the end of a fiscal year. He is committed to carry on the existing system for several years at least.

It is not obstinacy which makes the farmer continue to raise crops on which he is losing money. Nor is it ignorance of economics, or stupidity. Though city dwellers are all too prone to accuse him of all these sins. It is because he is caught in a system. Any new experiment he makes requires several years to prove itself; and with climate a continual variant, no new venture can be proved with a single trial. Any mistake or rash judgment involves several years of loss.

It is this which makes the man on the land a conservative. He might be more of a gambler, and readier to make changes with apparently changing conditions were he the sole commander of his fields. But he is not. Besides the ebb and flow of economic tides which wash the shores of industry and business, the farmer has to take into account wind, rains, blizzards, floods, droughts, frosts, heat, cyclones, dust storms, grasshoppers, gypsy moths, chinch bugs, corn-borers, blight, rot and smut. All and any one of these may enter into his bookkeeping every year. No matter how he tends his fences he cannot insure his fields against them. All these deliver the farmer from any possible egotism. He knows that success or failure does not rest with him alone. On the farm, God is always the silent partner. The articulate half of the partnership may expostulate or rebel, but the covenant still binds. It is irrevocable.

There was a man who planted thirty acres of corn. A week after the hills sprouted, the heavens opened and the rains washed new corn and top-soil into the creek. The next spring the man plowed and planted that thirty acres to corn again. The young crop thrived through May and June. Then came the heat, and six weeks of drought. The corn burned in the ground before it could tassle.

That winter the man and his wife were on the town. When another April came, the farmer got out the plow and started a first furrow across the thirty-acre field. His wife came out to the fence rail.

"Len, you're not going to plant that field all over again?"

"That's what I aim to do."

She went back to the house, baffled. All day she watched him and the lengthening furrows. But neither that day, nor the next, nor at any time while the plowing went on did she venture any more remonstrances. She knew it was no use. Only on the day she saw him get out the sacks of seed corn, she drew down the blinds in the kitchen and refused to look out at all.

Spring touched the land tenderly. The maple buds swelled. The wild cherries and dogwood blossomed. Soft rain fell at night, and the sun broke through the mists with morning. Catbirds nested in the lilacs by the farmhouse door. The rhubarb leaped out of its barrel. The woman knew, though her eyes would not look that way, that the thirty-acre lot would be green with young corn.

Then came three days of unseasonable heat. The lilac leaves drooped, and the dogwood dropped its petals. The cattle were uneasy in the pasture. Toward sunset on the third day a mass of copper-colored clouds gathered on the horizon. A leaden stillness weighted the earth. Two hours later the cyclone burst. You could hear the waters running in the hills before the rain swept down the valley.

All night it rained. The storm beat venomously on the earth. All night the man and the woman lay side by side, sleepless; yet silent. What was there to say?

In the morning the woman stood at the kitchen door and looked through the driving rain at the raddled fields. Her husband came and stood beside her. Then it was, at last, she turned to him.

In his face shone a savage joy. He lifted his fist and shook it at the sky.

"Yah! Fooled you that time, God. I didn't plant her after all."

Men said of the corn belt, "God made this country for

corn." Sometimes they changed it to "God made corn for this country." It didn't matter which way you put it. It was true both ways.

Here were one hundred and forty million acres, more than half of which was in plow-land. Forty-five million acres of this in corn. This represents 65 percent of all the corn grown in the country.

Three factors necessary to corn-growing meet in the corn belt. These are a deep, rich, well-drained soil, abundant rainfall and hot summer nights. All plants derive their nourishment from two sources, the air and the soil. The first supplies oxygen and carbon dioxide which the plant takes in through leaves and stalk. Meanwhile the roots feel around through the soil in search of the ten chemical elements which are vitally necessary to every plant's growth. These are nitrogen, phosphorus, potassium, calcium, sulphur, magnesium, sodium, iron, chlorine and silicon. The first three of these are most in demand, but each one of the ten elements is essential to the development of some part of the plant. Nor can any excess of any one element make up for the deficiency of another. There is a wide difference in the amount of each that is required by each plant. To plant potatoes, for instance, in a soil which is rich in nitrogen and phosphoric acid, but low in potassium, is to court famine. Nitrogen, potassium and calcium are needed to form the larger part of the corn's tissues. The last does valuable work in hardening the stalk to withstand drought. Calcium is a characteristic constituent of the limestone soils of the corn belt.

The clovers, vetches and peas which are gross nitrogen feeders have developed the ability to draw nitrogen from the air as well as from the soil. Buds of the chemical are stored on the plants' roots. This makes them valuable as "green manure" to enrich the fields for corn to follow the next year. The corn is greedy. When young it requires plenty of easily available food.

Research in soil and plant chemistry is a relatively new science. Its findings and warnings are still new voices to many

farmers. Over-cropping, which exhausted New England's fields within a century and a half, was practiced by many farmers in the corn belt up to the time the A.A.A. went into action. There were men who simply refused to believe that the soil which had grown corn twenty feet high for their fathers could ever be spent. Nor could they understand that even top-dressing the soil with manure would not give it all the chemical values it needed for complete fertility. Manure, they argued, made rich soil. Rich soil would grow rich crops. If the harvest failed, it could not be the fault of the soil. Rather, God or the government was to blame.

A lot of hard times on the farm have been laid to the Republicans or the Democrats, or to sin, which were really directly attributable to farmers raising the same crop on the same acreage year after year. In the agricultural colleges they taught the values of crop rotation and green manuring. The County Agents lectured on soil analysis and the chemical properties necessary to vegetable growth. The younger men listened and paid heed to these things. A few of them had been to the state agricultural schools and were aware that science had a place in agriculture. But the older generation of dirt farmers spat their disgust for book-farming.

"Bought wit's better'n taught wit. . . . You can't teach your grandmother to suck eggs. . . . What these young fellers need to find out is that farming ain't done outa books. It's done with sweat. Fact is, some years are good, and some are bad. There's always been chinch bugs and hoppergrasses, and there always will be. A man has got to take 'em, and make the best of 'em. That's bein' a man. Just let these college farmers take a-holt of plow handles instead of a book and see what that'll larn 'em. . . ."

There was no use telling these die-hards that Chinese farmers have kept their soil at the same state of productivity for four thousand years. "Shucks! As if there was anything a Chineese could teach an American!"

There is a terrible bravery about the battle ignorance puts

up against enlightenment. It works so hard. As though it thought that by the grimness of its labor, and its stoicism under suffering, it could push back the dawn.

So while one farmer accepted the fact that a plant took something out of the earth to make it grow, and that that something was not restored to the soil by one winter's blizzards or the April rains, and that even rotted cow manure did not contain all the food elements the corn needed, his neighbor went right on planting his corn in the same ground year after year. When the harvests fell off, he blamed the seed corn; or a late frost; or a dry spell in July. When smut blackened the ears, he laid it to too much rain. When the corn-root worm and the corn-ear worm infested his fields, he lamented that the frontier had closed and that there was no more cheap land lying farther west that he could move on to, as his father and grandfather had moved.

A depression in agriculture had already set in during the seventies. After the war years, prices fell. Surplus crops mounted. The burden of debt settled on the farmers in the corn belt who had helped to feed the Union. In the twenty years between 1880 and the opening of the new century, tenancy in this country rose 10 percent. In that period, though American agriculture extended its horizons, it was in reality being operated at a small profit or at none at all. What sustained the individual farmer was the constant rise in land values. Land which he had bought at \$1.25 the acre, with thirty years in which to pay it, he sold at \$25.00 the acre to newcomers from Europe, eager to settle on American farms. If he did not sell, the high value of his land enabled him to convert his floating debts into mortgages. The natural result was that mortgage indebtedness became heavier every year. Every year a large and still larger share of the farmer's crops went to pay interest charges, and taxes which went up steadily with the increased valuation of the land.

After the Revolution, Daniel Shays had led Massachusetts farmers against the bankers whose power had stretched out

from the towns to seize the tillable lands. The same situation began to repeat itself in the corn belt. But there was no Daniel Shays. Instead, there were the Patrons of Husbandry, the National Grange. Organized in 1867, along with several other farmers associations, the Grange was at first merely a fraternal organization. The depression of the seventies put it into politics. It quickly became a dominant factor in Illinois and Iowa—the leading corn-growing states. The Grange protested against the railroads' grabbing of lands, demanded state agricultural colleges, compulsory education, weather bureaus, national regulation of weights and measures, and commercial treaties to open world markets for American farm produce. The export of American corn to Europe reached its peak in 1899-1900 with the shipment of two hundred and thirteen million bushels.

During those years the cities in the corn belt which had grown up as markets for the shipment of farm produce entered on an era of industrialization. The character of the towns changed. Their suburbs reached out and engulfed lands where formerly cattle had grazed, or farmers had planted corn and wheat. The owners of those farms sold them and retired to front-porch existences in the villages. Or they responded to the lure of Florida orange groves and prune ranches in the Santa Clara Valley. For the first time the progress of America altered its historic pattern. Men fled before advancing civilization, not to a harsh frontier, but to the promise of tropical ease.

The history of this country may be written in the terms of the migration of peoples, first from the old countries of Europe to wider opportunities here; later from the Atlantic seaboard westward, and still westward. Massachusetts poured into Ohio and the Illinois country. Virginia and the Carolinas sprawled over the mountains into Kentucky and Tennessee, and later into Indiana. Illinois and Indiana ventured into Iowa and the Dakotas. Kansas and Colorado struck out across the plains and over the divide to California.

This migration, the most dramatic since the Arabs overran

central and southern Europe, has so filled the foreground of our history that we are scarcely conscious of another movement which has been going on steadily for the past century and a half. This is the flow from the farm to the city, and back to the farm again. It started, in the east, during the first rush of industrial and mercantile growth after the Revolution. Young men born in the Back Woods became drovers, and herded cattle to the cities for sale. There many of them remained, to become apprentices in shops and in counting-houses; and later pursy merchants, bankers and promoters of land schemes in the new west. While some of the returned soldiers left New England for the Black Wilderness with Rufus Putnam, others followed the path of Franklin to the growing towns. Always, when there was a slump in farm values, the fields sent their crop of young men to the paved streets.

The ebb from the farms, which increased steadily after the Civil War years, went on for a half century up to our entry into the World War. In Illinois, corn acreage diminished annually. Meanwhile towns sprang up and cities swelled to startling proportions. The farmers who remained on their land had markets aplenty, and close at hand, for their corn, pork and lard. It might seem that this would have ensured the farming class widespread prosperity. It did create wealth for many; but as it greatly increased the taxes and land valuations it also laid a burden of debt on the fields.

The growth of the towns brought something else to the farms. This was discontent. The disparity between life on the farm and life in the towns, where there were gas—later electricity—city water, plumbing, opportunities for education and amusement and social life, was too striking not to have its effect on the farmers' sons and daughters. Farmers' wives, who had scrimped and saved all their lives, made butter and raised poultry for the only money they ever handled, urged their daughters to marry men with wages or salaries, men who could give their wives homes with a bathroom and a kitchen sink.

And something to look at, out the window, besides endless cornfields.

The factories called the farmers' sons. Young men who had been born on the land gave up the sky above their heads to stand in one spot for eight hours, five and a half days a week, and make one carefully regulated motion over and over again. When a siren blew, they filed out to return to homes squeezed shoulder to shoulder along a shadeless street. And to suppers out of cans, heated up on gas stoves, by wives who knew all about Mary Pickford and nothing at all about salting pork or putting down eggs. Life was so much easier for them than it had been for their parents or grandparents, who had bought the acres from the government or from the railroads, that they should have been happy. But they weren't. For one thing, this mechanized existence gave them no opportunity to make use of the adaptability which is the most valuable part of the American heritage. Through a number of generations on the American soil this hereditary characteristic was in process of development in the race of pioneers. On the farms, as on the frontier, opportunities for its expression were constant. Suddenly, within a single generation, the need for this quality was cut down. The push-button era gave a man with a genius for making shift no outlet for his gift. "The exercise of the adaptive function," to quote the author of *Man the Unknown*, "appears to be indispensable to the optimum development of man." A life laid out by efficiency and industrial engineers, with no droughts or blizzards in it, is a sorry sort of existence for sod-busters' sons.

The booming of guns over Belgium started the tide of migration in America back to the farms. Farming which paid dividends became a desirable occupation. Men raising food were exempted from war service. Under the stimulus of war and world markets for farm produce, men plowed up abandoned fields which had been left to the Canadian thistle, butterfly weed and the wild rabbits. Lands which had been turned

over to the grazing of cattle were furrowed to make wheat fields and cornfields.

The story of the war boom and its effect on American corn-growers has been told in another chapter. Its interest for us here lies in what it reveals of the farmers' changed attitude toward scientific farming. The men who had left the farms for the towns and for jobs in mills and machine shops had learned something during their stay there. They had learned that science can teach a man how to lighten his labor, and how to increase his chances of success. They brought this altered point of view back to the land with them when they returned. Few of them now derided book-taught farming. They sent for the bulletins published by the Department of Agriculture and the State Experiment Stations. They sent their sons to state colleges. And their daughters. They began to look on farming as a business, as well as a way of life.

Crop rotation and the testing of seed corn became the rule, not the exception, in the corn belt. In Franklin County, Indiana, farmers built a plant for making rag-doll tests. It was only one of hundreds of co-operative ventures tried in agriculture. Meanwhile, carloads of grain moved along all the railroads to the Atlantic ports. The ships went out laden to the gunwales. Bread for Belgium, for France, for starving Armenians. Bread for whoever would take it. True, a fleet of ships loaded with wheat which Americans had saved by eating cornbread as a patriotic duty, lay in the Thames while England wondered what to do with the cargo. Then someone had the bright idea of carting the wheat to the breweries to be turned into British ale.

Not only did science teach the farmer how to save his soil and improve the quality of his seed corn, it taught him how to fight the pests of grasshoppers and chinch bugs, corn-ear and corn-root worms, rots and smut which attacked the crop. Actually, corn suffers less from enemies of this sort than any other grain crop. In the early days squirrels cost the farmers heavily. Many a boy learned to be a good shot by being sta-

tioned in the corn with his father's rifle against hordes of gray squirrels. Squirrel meat made good stew; and squirrel skins, dried on the barn door, were worth a dime apiece when the fur-buyers came through the country in the spring. Gray squirrels put more than one farmer's son through college.

Science taught the farmer to give his fields clean cultivation right up to the fences as protection against pests. It taught him to burn the rubbish and stubble; to plow in the fall in order to kill the grubs of cut-worms; to spread poison bait for grasshoppers which came, every so often, in a dark cloud out of the west, and would eat up a farm in a day. Above all, it urged him to rotate the crops as a means of prevention against diseases and to breed corn which was smut-resistant. When the European corn-borer made its appearance here, in broom corn imported from Italy or Hungary, the farmers turned naturally to the Department of Agriculture for help and advice. Abraham Lincoln's dream of a federal government so organized that it could serve the man on the land was coming true.

During the forty years between 1855 and 1895, the time required to produce one bushel of corn was cut from four hours and thirty-four minutes, to forty-one minutes. The steel plow which superseded Jethro Wood's invention in cast iron had had a lot to do with that. Now the manufacturers were offering farmers motor plows, mechanical corn-pickers and corn-huskers; all guaranteed to cut still further the time required to raise a crop. Here was science again, holding out the promise of leisure to the man on the land.

Henry Ford demonstrated that by employing factory methods and harnessing tractors, seven days' work in a season were sufficient to sow, cultivate and reap a harvest.

Farmers who had been convinced of the benefits of science in the realm of chemistry and botany were open to conviction by salesmen, and their sons who would rather drive a \$2200 motor truck than a four-mule team, that motor power on the farm ensured bigger profits. Didn't cutting down the hours of

labor per hundred acres make possible the plowing and planting of greatly increased acreage? Bigger farms, plus scientific methods, meant bigger crops; and by all the known laws of economics, bigger profits.

The argument won. The century which began with the invention of the cast-iron plow closed with one million, two hundred and fifty thousand tractors at work on American farms.

What happened to the laws of economics? Was it the series of droughts which scorched the crop lands for several successive years? The drought of 1934 was the worst in this country's history. One out of every seven farmers in America went on relief. Neither scientific farming nor motor power on the farm could hold off the enemy. Was it the series of floods which washed the alluvial soil down the rivers to the Gulf? Motor power won't stop the waters. Was it the turning of vast areas into dust bowls? Dr. Hugh Bennett, chief of the Soil Conservation Service, told the House Labor Committee: "We are losing every day, as a result of erosion, the equivalent of two hundred forty-acre farms." Was it the passing of the country banker, and the increased control of rural by urban banks? The decade 1921-1931 was one of unprecedented mortality among banks. The final year of that period saw more than two thousand failures. Mortality was highest in the mid-west and south—in the corn-growing area—and in centers of under ten thousand population. These failures, and the mergers with larger banks which took place in great number during the period, were owing in very few cases to departure from normal banking practice. They reflected the decline in land values, and in the prices of farm produce. The Wall Street crash sent its effects out through the country because of the heavy losses by important patrons of local banks.

Business suffered from bank failures; but the farmers suffered even more, for the reason that in the small centers banking is almost a personal service. The urban control of rural banks, which is a trend of the times, can result in real hard-

ship to farmers because of the new management's lack of information in regard to agriculture, and because of the delay involved in securing action on farm loans. In one village, seven of the best farmers, each owning from two hundred and forty to three hundred and sixty acres of unencumbered land, were refused loans of from \$400 to \$800 for seed and fertilizer in the spring of 1931.

These are the enemies of the cornfields. Not the thieving crows, or the ear-worm or the borer. Not the smut; though the black fungoid growth ruins millions of ears each season. Recent experiments have revealed that corn smut is edible. It may even, in time, so the hopeful say, compete with mushrooms as a table delicacy! No, the enemies are drought, ignorance, waste of natural resources, faulty economics. Every year these take heavy toll of our harvest. Their conquest is an immediate challenge to American adaptability and to American imagination.



XXII

Tomorrow's Harvest

IF YOU plant one acre of good cornland with hybrid corn, with any luck in the world you may expect to gather a harvest of sixty bushels. This, at the present market price for corn, is worth approximately \$36.

But there are any number of other ways of valuing a bushel of shelled corn than in dollars and cents. For instance, it is worth any one of the following:

43	lbs.	corn meal
5	gals.	corn liquor
10	lbs.	pork
30	lbs.	starch
40	lbs.	corn syrup
1 ½	lbs.	corn oil
25	lbs.	dextrose

Moreover, the cobs from which the corn has been shelled have a value to the smokers of corncob pipes. In south central Missouri the farmers grow a large-eared variety of corn, the cobs of which are worth as much as ordinary corn brings on the ear. The Missouri corncob pipe industry amounts annually to some \$500,000.

Corn silk, out of which generations of American youth have surreptitiously rolled their first cigarettes to puff them valiantly behind the barn (there were only the cows to see how sick you were) is used in filters. The pith of the cornstalks packs the coffer-dams of our battleships. Americans have been born and have died on corn-husk mattresses. Many a Negro and "poor white" child has loved a corn-husk doll. Those children

may grow up to wear rayon clothing made out of cornstalks, husks, straw and screenings which are now the waste at the grain elevators. Nearly a century ago a Czech inventor patented a process for making paper out of the stalks of *zea mays*. The Austro-Hungarian monarchy was eager to find more and wider uses for the American corn the peasants along the Danube grew so prolifically. Cornstalk paper is of excellent quality. There have been a number of attempts made in this country to manufacture it and put it on sale. These have failed, not because of the product, but because wood pulp is so cheap that we seem to prefer wasting our forests, thereby creating floods and droughts and losing thousands of acres of arable land annually, to growing our books and magazines on the farm.

Besides all these, and the cornstalk wallboard which insulates our houses and absorbs some of the noise we create, the manufacture of the seven commodities listed results in a number of valuable by-products in the way of plastics, stock feed, and carbon dioxide. The last is a left-over from the distilling of corn liquor. It is recovered, compressed, and sold as "dry ice." Meanwhile in South Dakota and in Kansas, distilleries have been opened for the making of argol, a new commercial alcohol whose source is sorghum, potatoes, corn and other grains. Argol is used to step up gasoline. It promises a future when motor power on the farm may be grown where it is used.

But it is as food that corn has its widest use. Its rich store of carbohydrate makes it the greatest energy-producing food the earth yields. It may be that the secret of the rise of American civilization lies in the endosperm of the American corn.

It required energy to conquer a continent and give birth to a nation. It took energy to clear the forests, to penetrate the Back Woods, to cross the Alleghenies, to explore thousands of miles of inland rivers, to fight savages, to raise cities on the prairie. That energy came from corn. Those poor Spaniards, whom Peter Martyr pitied because they were forced to subsist for five days at a time on nothing but parched corn, were

better fed for the task they were engaged upon than if they had stuffed themselves with beef, chile, and *baccalao*.

A supply of carbohydrate is essential to the diet. It is nature's insurance against fatigue and exhaustion from prolonged physical effort. More than 65 percent of the total calories we require to maintain life are supplied by the oxidation of carbohydrate. The surplus of this energy food is stored as fat, giving the body a corn-fed contour; which brings us back to the premise that Nature seems to have made corn for a people she expected to do things.

Corn is low in protein. Also it lacks several of the important amino acids. But the oil in its germ is the richest known source of vitamin F lineolic acid—equivalent to linoleic acid. This vitamin, which is also found in lard, in eggs and in linseed oil, is essential for cell respiration, secretion of insulin and the proper development of the skin and hair. It is a precious constituent of breast milk, which is lacking in cow's milk. Hence the value of corn oil as a food for some infants.

Glucose, which is corn syrup, and dextrose are used in medicine to supply immediate energy to the body. It is the dextrose in orange juice and in all other ripe fruits which makes these foods refreshing when you are tired. Dextrose, being pre-digested sugar, is available to the blood stream at once. This gives it its medicinal value. A five-pound baby boy was delivered by a Caesarean operation eight minutes after his mother had died. After administration of oxygen, the child was fed dextrose solution through a medicine dropper for twenty-four hours. At the end of that time he was ready to take breast milk. Ten days later he was put on a formula of cow's milk and corn oil.

This young American literally owes his life to corn.

In view of these facts it would seem that there is little likelihood that this country will ever cease to grow corn. The grain has not only supplied us with our national history, it promises our future. That we are aware of this, even though subconsciously, was shown by the nationwide alarm when the

Agricultural Adjustment Administration began to pay the farmers not to plant their corn acres. Men and women who had lived all their lives in the cities were horrified at this interference with the business of the earth. They feared Coatlicue's revenge. It is true that man frequently cheats his neighbor with impunity. He does not get off so easily when he attempts to cheat Nature. Nature has a feminine way of going on with her business of creation and procreation sublimely regardless of whether man decrees that it is legal or illegal for her to do so.

When Peyton Locker was a small boy on the farm in Virginia, he wanted a horse of his own. He said so to his mother. Gentle and religious, she had a horror of what a horse could carry a man to. Horses took young men from home to sow wild oats.

"What about a dog?" she suggested. "Didn't I hear Cousin Lulie Buchanan saying the other day that somebody had given Cousin Joe another bird dog? And that she'd just have to put her foot down? Why don't you go over to Burnside and see Cousin Joe about it?"

The dog which had occasioned that gesture of Cousin Lulie's foot was a beautiful Llewellyn setter bitch. Peyton took her to his heart and named her Sally after his favorite cousin. His mother, rocking on the veranda, sighed relievedly. A dog wasn't like a horse. A dog was safe.

Sally's pups, when they came, were as beautiful as she. Peyton swapped two of them for a Poland China shoat which he put into the pen with his father's pigs and watched it fatten with silent satisfaction. Corn was plentiful.

His father said, "That hog of yours will be about right to butcher in January."

"I don't aim to butcher her this year," his son replied. "I aim to keep her till she farrows."

His father agreed there was sense in this. The hog was bred, and ultimately produced a litter of nine piglets. Every day

Peyton, with Sally at his heels, went down to the hog-lot and spent half an hour throwing corn to his herd.

"Go on, you pigs," he muttered. "Eat. Go on and eat. . . ."

That fall Peyton swapped five of his pigs with Sam Baxter for a mule that was blind in one eye. His father approved the deal. He said, "If you'll plow and plant five acres of corn next year you can have the crop."

Later he told his wife, "I don't know but that boy will make a farmer yet."

The boy kept his share of the bargain. He and the blind mule conquered the stubborn soil. The corn they planted grew. Meanwhile Sally nursed her third litter of pups under the big locust by the well-house, and a second generation of Poland China pigs rooted for beechnuts, and did their best to squeeze under the fence to get into the corn.

On a day in Indian summer Peyton harnessed the blind mule to a spring wagon, loaded on the corn from his five acres, six Poland Chinas and two setter pups, and drove into town. When he came home he was walking. He led by a rope a colt whose grandsire was said to have almost won the Kentucky Derby.

After all, Mrs. Locker told herself after feeling the colt's soft, nuzzling nose, a colt wasn't the same as a horse.

Every year the County Fair was held in Charlottesville, twenty miles away. Peyton and Cousin Joe's boy Wynne had permission to go. They drove the colt, now a two-year-old, and stayed the nights with Second-Cousin Mamie Potts whose home was in Charlottesville. Together they had five dollars to spend.

The greatest yearly event in the county was the Free-To-All-Entries Race which was held regularly on the last day of the Fair. The horses came from all parts of the county, and were of every size, age, class and rate of speed. The prize was a purse of two hundred and fifty dollars.

When the entry booth opened that morning, the first

horse owner in line was Peyton. The colt, Stardust, was entered. The odds against her were forty to one.

Of course, by all the laws of morality, it should not have happened that way at all. But Nature, I repeat, is not interested in morality or in laws. Her business is production. It may be she smiled when the bay two-year-old, driven by a twelve-year-old boy, won the Free-For-All by three seconds.

Peyton and Wynne were very quiet on the drive home. Peyton hid his half of the winnings and the prize money in the barn. It seemed wiser not to say anything about what had happened in Charlottesville. Anyway, not until Thursday, when the county newspaper would be out with a full account of the Fair.

But it was only Monday when a strange man drove up to the house and told the house servant he had come to see Mr. Locker.

"It's about that bay two-year-old of his that won the race over to Charlottesville last week."

Mr. Locker and his son spent a long time together in the office. There was no need to close the door. Mrs. Locker was upstairs, in tears. On the office desk was the roll of bills Peyton had brought from the haymow. His father said slowly, "Three hundred dollars'll go a long way toward paying for you at V.M.I. It seems like you're not cut out for a farming life. But I don't know how you'll ever make this up to your mother."

Peyton was wondering about that, too. During the five days before he was to start for V.M.I. he was "on bounds," forbidden to leave the veranda. From his perch there he could hear his mother talking to Cousin Lulie Buchanan. "I don't know. Lulie, I did my best with the boy. But somewhere I must have made a mistake. I don't know just what it was . . ."

Three years of partnership with Nature had taught Peyton many things. He spoke quietly over his shoulder, "The only mistake you made, Mamma, was the kind of dog Sally is. If

you hadn't wanted things to happen, you hadn't ought to have got me a bitch."

It is true, you cannot stop Nature. You can only co-operate with her. Even that is a privilege which sometimes costs a man dear. For Nature knows no laws but her own. You can explore those laws, as Mendel and the geneticists have done. You can invoke them, which is the way of the corn-makers. You can submit to them. The last is perhaps the wisest course for the many.

For man has not yet learned more than a fraction of what Nature has to teach. The problems which confront the corn-growers today; the problem of changing farm values; the problem presented by the disparity between standards of living in the towns and on the land; the problem expressed in that equation which reveals that whenever food is plentiful and cheap at its source, the cost of transporting it to the consumer goes up, are advance notices of the lessons Nature is about to teach us. Actually, the freight rates of American railroads make corn shipped from the corn belt to New York more costly than Argentine corn shipped to the same port from Buenos Aires.

The only progress man ever makes is at the point of discomfort. Nature knows this, for it is one of her laws, too.

As our civilization has unfolded to the point where few of us can use, and none of us requires, all of the energy which corn as a food has to give, the push and squeeze of circumstances are forcing us to turn our American cornfed genius for adaptability toward finding new outlets for the life which is stored in the golden kernels of the American grain.

It may be said that we are beginning at last to digest our corn with our brains.



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